ETC

A REVIEW OF GENERAL SEMANTICS

SUMMER 1955

an international quarterly concerned with the role of language and other symbols in human behavior and human affairs

In Volume XII, Number 4:

SPECIAL ISSUE ON TRANSACTIONAL PSYCHOLOGY

"Toward a Humanistic Psychology" by HADLEY CANTRIL.

Education, says EARL C. KELLEY, is communication.

F. P. KILPATRICK shows the relation between perception theory and general semantics.

P. W. BRIDGMAN writes on "Science and Common Sense."

A fable: "The Blind Men and the Elephant," by RAYMOND CORSINI.

Articles and reviews by DONALD AYRES PIATT, MARTIN MALONEY, HANS TOCH, S. I. HAYAKAWA.

etc. etc.

One Dollar

ETC.: A REVIEW OF GENERAL SEMANTICS

OFFICIAL ORGAN OF THE INTERNATIONAL SOCIETY FOR GENERAL SEMANTICS, FOR THE ENCOURAGEMENT OF SCIENTIFIC RESEARCH AND THEORETICAL INQUIRY INTO NON-ARISTOTELIAN SYSTEMS AND GENERAL SEMANTICS. FOUR TIMES A YEAR: SEPTEMBER, DECEMBER, MARCH, JUNE.

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CONTENTS FOR SUMMER 1955

[Published November, 1955]

FOREWORD TO THE SPECIAL ISSUE ON TRANSACTIONAL PSYCHOLOGY	S. I. Hayakawa	243
OBITER DICTA: THE BLIND MEN AND THE ELEPHANT: THREE ENDS TO ONE TALE	Raymond J. Corsini	245
EDUCATION IS COMMUNICATION	Earl C. Kelley	248
PERCEPTION THEORY AND GENERAL SEMANTICS	F. P. Kilpatrick	257
SCIENCE AND COMMON SENSE	P. W. Bridgman	265
TOWARD A HUMANISTIC PSYCHOLOGY	Hadley Cantril	278
THE IMPORT OF THE WORD "TRANSACTION" IN DEWEY'S PHILOSOPHY	Donald Ayres Piatt	299

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How Are Data Interpreted?
A Transactional View — Hans H. Toch 309

Book Reviews:

H. A. Witkin and others, *Personality Through Perception* — Franklin P. Kilpatrick 315

John Dewey, *Knowing and The Unknown* — Martin Maloney 318

Lawrence K. Frank, *Nature and Human Nature: Man's New Image of Himself* — Martin Maloney 318

A. C. Spectorsky, *The Exurbanites* — S. I. Hayakawa 323

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Foreword

FOR some years students of general semantics have been making increasing use, in their lectures and their writing, of transactional psychology. Meanwhile, students of transactional psychology have simultaneously been showing increasing interest in general semantics. The affinity between these two approaches has resulted in this present Special Issue on Transactional Psychology, in which the Editors of *ETC.* are happy to introduce some of the most distinguished exponents of the transactional point of view, along with other contributors who, in their several ways, show the relation between general semantics and transactional psychology, and the relation of both of these to some of the most pressing intellectual problems of our times.

The word "transaction," drawn from the language of business, was endowed with its new meanings by John Dewey and Arthur F. Bentley in their book *Knowing and the Known* (Boston, 1949), reviewed in this issue. A transaction, in the language of everyday life, is an exchange of values. The Dewey-Bentley word acquires its new demensions of meaning from the unexpected contexts in which it is placed. For Dewey and Bentley "transactions" occur whenever there are knowers-to-be and to-be-knowns. The knower-to-be is never the passive absorber of light-rays and recorder of sounds and impressions. He is a ferment of abstracting, projecting, and integrating activities. And on what he has integrated, he "makes his investment," "places his bets," or, in short, acts. And if the to-be-known "pays off," it can be regarded as "known"—at least until it ceases to "pay off," in which case a new integration is necessary. In other words, the "reality" we have to deal with, described often in modern philosophy of science as the relationship between the observer and the observed, is, in the language of transactional psychology, a "transaction," in which the knower brings to any event the entirety of his past experiences and integrations, and in which the known brings whatever it has to bring. And "reality" is neither within the knower himself nor in the known itself, but in the "transaction" between the two.

This way of talking and thinking about human experience is itself "paying off." Already the transactional point of view has proved fruitful in several fields. Earl C. Kelley's immensely provocative *Education for What Is Real* (New York, 1947) draws out the implications of transactional psychology for educational theory and practice. It has lit fires in art theory, too, as is attested by Norman T. Newton's *An Approach to Design* (Cambridge, Mass., 1951) and Hoyt L. Sherman's *Cezanne and Visual Form* (Columbus, Ohio, 1952). In

psychology (perception theory) and in the social sciences, transactional psychology is also making fundamental contributions.

It all began in the basement of the Choate House in Hanover, New Hampshire. There, in the later 1930's, Mr. Adelbert Ames, Jr., who, among other things, was an expert in physiological optics, a designer of lenses, and founder of the Dartmouth Eye Clinic, was demonstrating to a small but interested public a set of ingenious optical illusions. What gave fascination to these illusions was the fact that there was discernible in them a pattern—a common denominator that made vividly concrete some half-suspected but not-too-well-understood relationships among perceptions, actions, and purposes. There was something about the illusions deserving of systematic explanation. Why, for example, does a *rotating* trapezoid painted to look like a window look, instead, like a rectangular window *wigwagging back and forth?* Why does it continue to look this way even when we know that it is rotating? What is "stimulus" and what is "response" when the "responding" organism appears to play a considerable part in creating the "stimulus"? Korzybski had made the same point in another way when he used to rotate a set of flat blades (arranged roughly like an electric fan) until it looked like a disk. "Where is that disk?" he would ask. Then stopping the mechanism so that the blades were again apparent, he would say, "You *made* that disk inside your head!"

Mr. Ames, as director of the Hanover Institute, in cooperation with such men as Hadley Cantril of Princeton University and Earl C. Kelley of Wayne University, continued to study the implications of these illusions. In 1946, some of the demonstrations were moved to Princeton, where they were first set up in the basement of a dormitory.

Now the Ames Demonstrations and their not inconsiderable literature are safely out of the basement. They are being used in at least 130 research centers scattered through 19 countries. There is a Perception Demonstration Center at Princeton University, and at Ohio State University Ross Mooney and Hoyt Sherman have established the Visual Demonstration Center. And most importantly, the conceptual framework provided by Dewey and Bentley has clarified the questions and sharpened the research instigated by the demonstrations.

KORZYBSKI referred to his program of general semantics as scientific, *epistemological* retraining and education. The revision of language as such was not his goal, unless such revision emerged from the *revision of basic assumptions about the nature of our knowings.* Transactional psychology is important to students of general semantics because it enriches and challenges their basic theoretical formulations, and because it confirms their central perceptions through a wealth of experimental evidence of a kind that they themselves have been slow to produce.—*S.I.H., J.R.K.*

✡ OBITER DICTA ✡

THE BLIND MEN AND THE ELEPHANT: THREE ENDS TO ONE TALE

RAYMOND J. CORSINI *

MANY centuries have passed after the fact, but is it possible to discover the end of the tale of the Blind Men and the Elephant? Ali thought the Elephant to be like a spear, Bul like a fan, Con like a wall, Dor like a tree stump, and Eri like a rope. What happened thereafter has not been told. It is possible that man's fate depends on the end of the tale. Three endings are given below: the reader may take his choice.

END ONE

ALI, the eldest, spake: "I am the eldest, and consequently the wisest. I am also the first to have felt the Elephant and now the first to speak about him. Moreover, I felt him carefully, to the very end. He ends in a sharp point. He is hard, long, and smooth, and is like a spear which curves gently. My description of the Elephant may be regarded as definitive."

Bul spoke next: "It is true, Ali, that you are aged. Hence your faculties are dim. Also, if you are right, then I must be wrong. This is impossible, since phenomenologically reality is as I see it. Far from being like a spear, the Elephant is soft, wide, flat, and pulpy—very much like a fan."

"Reality is reality," stated Con. "I kicked the Elephant. He is massive, like a wall. He is limitless, infinite. I could find no end. Oh, the poverty of philosophy, the smallness of men who reduce infinity to the proportions of their own mean perceptions!"

Dor began to whirl his staff about his head, screaming: "No, no, no. Wrong, wrong, wrong! I started with fundamentals, from the ground up. The

* Dr. Corsini, who has had wide psychological experience in schools and correctional institutions, has contributed papers to *Journal of Consulting Psychology, Journal of Clinical Psychology, American Psychologist, Journal of Correctional Psychology, Group Psychotherapy,* and many others. He now teaches at University College, University of Chicago, and at Wilson Junior College, Chicago. The illustration on p. 247, by George A. Taylor, will be remembered by many of our readers as having appeared before in ISGS information bulletins and other semantic literature.

Elephant is like the trunk of a tree. By Allah and Moreno, you are all wrong."

At this point, his mouth frothing, Eri began to lay about him. "Liars, Adlerians, Catholics, Negroes . . . ."

Then the others began to labor each other with *their* heavy, iron-shafted staffs, yelling meanwhile, "Infidels, Rogerians, Trotskyites, Mormons, Semanticists, Jews, McCarthyites, Collectivists, Syndicalists, Behaviorists, Episcopalians, Dianeticists, Transactionists, Freudolators . . . ."

After a while, all was quiet. And when people came by, they found that all but one of the Blind Men were dead. One of the passers-by knelt beside the sole survivor, and seeing the dying man's lips moving, bent close.

"The others, are they dead?"

"Yes."

"Ah, then . . . then . . . *I* am right. The Elephant is like . . . ." But he then expired, and to this day no one knows what the Elephant is like.

End Two

Seminar-wise, the Blind Men gathered at a conference table, and Ali, the eldest, spake: "We have long been curious to know exactly what an elephant is like, and we have already gathered enough preliminary data to indicate that each of us has had different perceptions. Since the whole is at least the sum of its parts, let us try to reconstruct the beast by correlating the data we have gathered. From my experiential frame of reference, this is how the Elephant appears to me. . . ."

And so the Blind Men discussed the Elephant at length, and finally they arrived at an integration and summation of their perceptions. Thus they created what might be called the Eclectic Elephant, which was approved by all concerned, and became The Elephant. The Elephant was concluded to be a creature which had for a head a single spear-shaped protrusion; probably for decoration, but perhaps for protection from the sun, it had a kind of shade or parasol or fan; protrusion and fan were mounted on an enormous, wall-like body, upheld by a single stump-like leg; the creature ended with a rope-like tail.

A joint monograph on the Elephant was written by the Blind Men and was published in the *Hindustani Journal of Experimental and Comparative Zoology*. It remains the basic reference on the subject.

End Three

Ali, the eldest, spake: "It is evident that since we are blind we cannot really know what the Elephant is like." Bul nodded, "We can each get a part of the beast, but the whole escapes us. Our limitations are only too evident. And even a combination of our perceptions . . ."

" . . . is inadequate," added Con, "because the whole is more than . . ."

"There is probably more to the Elephant than what we have felt," stated Dor. "Perhaps if we called in still another blind man to feel the Elephant, he would see it as a volley-ball, a lawn-sprinkler, or an Austin car. We can never hope to understand. We are too mean and limited to obtain a just conception of this vast and noble beast. How may we ever realize this?"

"There is only one way," suggested Eri. "It is evident that what we must do to understand the Elephant is to ask someone who can *see*."

"A higher authority!" the other Blind Men shouted. "That's what we need."

So they went to consult a child of high reputation—the same child who had seen the Emperor as he was. "What is the Elephant like?" they asked.

"He is purple, has three heads, sixteen legs, crawls on his belly, and eats with his nose."

"And the spear?"

"It grows from his three eyes and is twelve ells long."

"And the fan?"

"He has hundreds. They flap in the wind."

"And the wall?"

"It extends for miles."

"And the stump?"

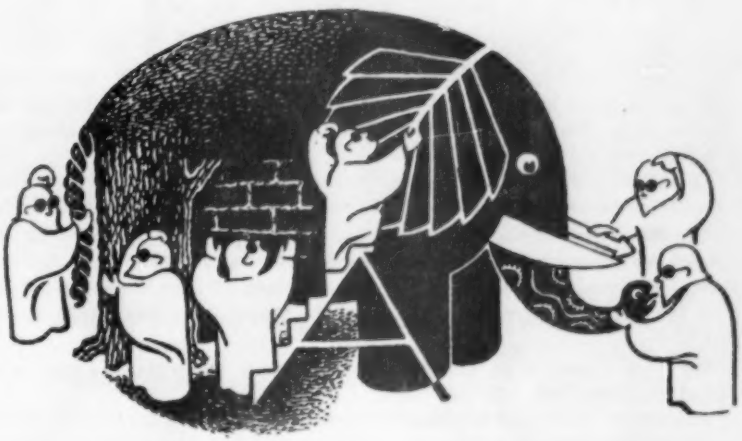
"A wart-like decoration."

"And the rope?"

"He hooks it on trees and climbs it."

And so the Blind Men were content.

SELAH



EDUCATION IS COMMUNICATION[1]

EARL C. KELLEY

In the last quarter century, and particularly in the last decade, great advances have been made in our knowledge of the nature of the human organism and how it learns. These new understandings, derived from laboratories, and as sound as we can hope for at any time in a changing and evolving world, call for great changes and great improvement in methods and outcomes in education. We can feel especially hopeful, because what is now known that is new supports the democratic ideal, and backs the concept of the dignity of the individual.

If I may be permitted to indulge in understatement, this new knowledge has not been received with general approbation. In fact, there has been much disturbance among both teachers and lay people over what has been referred to as "new-fangled" ideas. Even the newspapers and magazines have engaged in this type of argument, and strange indeed have been some of the pronouncements.[2]

The reasons for these resistances to the findings of research are easy to understand. The teachers who have built up lifelong habits based on the methods of antiquity naturally do not want to give up their habits and routines.[3] It is not comforting to have science discover that one's methods have been unscientific and need to be changed. The resulting discomfort often results in the denial of science, accompanied by name-calling, of which "new-fangled" is one of the milder and more quotable terms.[4]

[1] Presented at the International Design Conference, Aspen, Colorado, June 14, 1955. A member of the Board of Directors of ISGS, Dr. Kelley is professor of education at Wayne University and author of *Education for What is Real* (New York: Harper, 1947) and (with Marie Rasey) *Education and the Nature of Man* (New York: Harper, 1952). The reader is referred to these two books for an elaboration of the ideas expressed here.

[2] The literature in contradiction of laboratory evidence on this topic written by those who have not studied either data or method is voluminous and the reader has a wide range of choice. My favorite is Bernard Iddings Bell in "Know How vs. Know What," *Life*, Oct. 16, 1950. This choice would doubtless hurt the feelings of Arthur Bestor if he were to hear of it.

[3] See the discussion of the Alexandrian School, in *The Philosophy of Education*, W. H. Kilpatrick (New York, 1951), p. 222f.

[4] Incidentally, the atom and hydrogen bombs are new, and they certainly are fangled, but we never hear them referred to as new-fangled, nor do we hear them spoken of as though they weren't so.

The laymen who enter the lists against science apparently do so because they are not comfortable in a changing world, and are seeking a Firm Foundation, which seems available to them in what they call Standards and Fundamentals.[5] The thought that change is ever with us, that creation is not an accomplished fact but is now going on, and that even they are expected to have a part in it causes them to pall and tremble. So they try to halt the process of change and creation by denying its existence. King Canute's effort to stop the ocean waves by command was a puny enterprise compared to attempting by the same method to stop all creation.

This reluctance to accept the findings of science is a natural hazard for those who work in the study of human beings, and attempt to project meanings for modified human behavior. People cannot be changed as can wood or iron. Whereas a factory method in the manufacture of goods can be changed overnight, it may take years to change the attitudes, beliefs, and methods of a person, so that different behavior will result. Indeed, no person can basically modify his behavior until he sees himself in a revised role. It seems likely that this can be done only through experience. The spoken or written word is inadequate to the task. People seldom change basic behavior simply by being told that they should do so.

BECAUSE of the ways by which people are modified, it appears likely that the adoption of the scientific method in education will be a slow process. This change is the paramount need in education today. We have a large body of fact, though not as large as it will be, and by no means complete or final, about the nature of human beings and how they can learn. These knowings are gathered from many so-called fields of knowledge, or perhaps fields of endeavor would be more apropos. They come from studies in psychology, psychiatry, child development, biology, sociology, medicine, chemistry, physics, anthropology. If these discoveries were in the realm of the material, they would have been applied immediately. For manufacturers and craftsmen have long since, in the interest of survival, learned to look to nature, to the material or the desired product, to see what it is like and to proceed accordingly. This is the simple essence of the scientific method.

If this were applied to education, the teacher would look at the child, or the learner, to see what is known about him and how he learns, and build his method in keeping with these facts. Instead, he falls back on tradition, habit, and custom for his method, doing certain things because they have always been done, and because this method was the one by which he was educated, long before anyone knew any better.

[5] Here I refer to the many honest people who are genuinely concerned. There are a few others who, I believe, indulge in this type of activity for personal publicity or for economic reasons.

It is not possible here to give very much of the findings of recent research in the area of human development and learning. Many competent scientists have produced much concerning maturation, readiness, growth, glandular functions as they affect attitude and emotion, and so on. I shall attempt here to set forth some relatively new discoveries in the area of perception. I choose this area because of the great importance of knowing how perception functions, because it is the area I happen to have studied more than others, and because it is of such great importance to artists, designers, and all others who would communicate.[6]

Perception is that which comes into consciousness when stimuli, principally light or sound, impinge upon the organism from the outside. There are, of course, some additions to this, but the above definition accounts for nearly all perception. It is through the phenomenon of perception that we know anything at all about what is around us. It is a phenomenon because it does not take place in accordance with any mechanical device or set of rules. It hardly seems necessary to say anything about its obvious importance to learning.

Learning is modification of the organism through experience in such manner and degree as to cause it to behave differently under proper circumstances in the future. If there is no modification of behavior, there has been no learning, at least none of any significance. Learning thus depends upon perception, and there is no learning without it.

Perhaps the most important fact revealed by recent studies in perception is that *our perceptions come from us, not from our surroundings. The perceiver decides what an object is, and where it is. He makes it what he chooses to make it, and can make it, in the light of his unique experience and purpose. He can only perceive that which he has experience and purpose to perceive.*

SINCE what the learner learns is derived from his own unique experience and purpose, and his own interpretation of what impinges upon him from his externality, he creates a world of his own, which is not held in common with anyone else. Each individual is therefore the center of his own unique universe. He can share this universe with others through communication, but only in part; because those with whom he attempts to communicate must interpret what he offers in accordance with the receiver's own unique background.

We have long sought to make people alike by requiring them to learn the same things. We can now see that, instead of making people more alike by this attempt, we have, in the degree that we have succeeded, made them more different. Learning, because experience is uniquely interpreted, increases dissimilarity. Learning promotes uniqueness, rather than diminishing it.

One's perceptions are, of course, not unrelated to one's externality. The

[6] I am indebted to Dr. Adelbert A. Ames, Jr., of Hanover, N. H., and his associates, notably Professor Hadley Cantril, for what I have learned concerning this topic.

perceptive chain of events is started from things or people in one's surroundings. Few people have perceptions independent of whatever starts the stimuli. It is possible, however, for one to reject his whole externality and build a new one more to his liking. This is a common occurrence when people who are too pressed by life become psychotic. If our perceptions did not come from us, this would not be possible.

The most important thing in anyone's externality is other people. To be sure, we need desirable physical surroundings in order to sustain ourselves, and to provide comfort and esthetic satisfactions. But it is other people who provide what we need for the development of our psychological selves. The individual helps to build those who build him. This is not a transaction, because it is an automatic mutual exchange rather than a give-and-take, but "transaction" seems to be the best word available to describe what occurs.[7]

Since we build and are ourselves built by other people, we can see how great is our stake in them. The psychological function is developed with people, and the quality of the psychological self depends upon the quality of the people out of which it is built. This helps to explain why it is that children who grow in rich human environments—grow up with "good" people from the human point of view—become more adequate and more intelligent than those who are deprived of good human environments. Conversely, we can see why it is that children who grow up in starved human environments are themselves starved and inadequate, and this shows up in the form of low intelligence, resulting, in some cases, in anti-social behavior. Dullness is more an achievement than a gift, since starved environments tend to produce it. A rich or poor human environment has little to do with economics. Some of our most starved young grow up in rich economic situations.

The way in which the psychological self is built shows why no human being can become anything that we would call human without other humans. It gives the basis for the human need, or social need.[8] This need was recognized long before it was possible to explain it. People who have other humans to relate to become more human. Those who work in isolation grow in diverse and sometimes grotesque ways. Good human relations, concerning which so much has been said and written, are not just something nice to have. They are an imperative for the development of people. This answers again for us the ancient query, "Am I my brother's keeper?" We see now that if we are not our brother's keeper, it behooves us to become so, for he is the stuff out of which we are built, and our quality depends upon his.

[7] This is the word used by John Dewey to describe this phenomenon, although he recognized its shortcomings. We have only recently come to need a word for what is described above, and our language does not yet provide it.

[8] See Ashley Montague, *The Direction of Human Development* (New York: Harper & Bros., 1955) for a well-documented exposition of the social need in all living things.

THE FACT that our perceptions come from us, not from our surroundings, is a reversal of long-held beliefs. In fact, it turns the universe around, so that now the organism which receives the stimulus becomes all-important in what results. It has implications not only for education but for every aspect of life. We teachers too often act as though we were starting fresh with the learner, and as though all we have to do is tell him what we want him to know. How shall we tell a learner what a Russian is, or a capitalist, a labor leader, a Negro? It all depends on where he has been, what special brand of prejudice he harbors, what in the light of these pasts, he not only chooses to, but must, make of these symbols.

For a long time, it had been assumed that the organism which received the stimuli was *only* a receiver, that the object from which the stimulus originated was all-important, and that the viewer had no choice but to see it exactly as it was. If he did not see it as it was, then he was blamed, condemned as stupid, and efforts were made to "correct" him. This placed the learner in a position of unimportance and insignificance. This is the assumption of the authoritarian, and his basis for operation. In spite of our democratic form of government, it is the usual custom, in home, church and school, to assume that the child does not know and the adult does, and that therefore he must be told, and, having been told, he will know. If he does not know after we have told him, then he must be coerced.

Now it comes about that whatever we tell the learner, he will make something that is all his own out of it, and it will be different from what we held so dear and attempted to "transmit." He will build it into his own scheme of things, and relate it uniquely to what he already uniquely holds as experience. Thus he builds a world all his own, and what is really important is what he makes of what we tell him, not what we intended.

Since our perceptions come from us and each of us is the center of a world all his own, we have a scientific basis for individualism and for democracy. The authoritarian usually (not always) thinks and claims that he is promoting individualism. Actually he attempts to make people alike rather than different, and making people alike, if it were possible, would appear to reduce individualism, not promote it. To be sure, European fascists, nazis and the Russian dictators have not pretended to promote individualism, but the American "rugged individualist" is often an authoritarian person who thinks he is promoting individualism by making everybody just like him. So it is that often the rugged individualist inadvertently and effectually becomes the enemy of individualism.

THE STRUGGLE for democracy and freedom has been long. It did not start with Thomas Jefferson and the other American revolutionaries, nor with the barons at Runnymede. The dignity of the human individual has long been felt and proclaimed. Now we are able to see, by better understanding the way in

which the individual is built, why he is entitled to dignity and respect. It is not because somebody said so, however eloquently, but because he is the center of a unique universe of his own, and nobody has one like his. Reason has long supported the democratic ideal, and now science explains and supports it. If it were true that the human organism is only a receiver, then authoritarianism would make sense. Since each individual creates the world around him, the things and people from which the stimuli originate are reduced in significance, and the purposive, freedom-seeking creative individual comes into prominence. The democratic climate is thus a natural requirement, and we see why it is that authoritarianism can never finally triumph.

The implications of new understandings in perception for teaching and learning are enormous. If we try to deal with all of them, we shall have more to do than can be done in this type of paper. I shall therefore attempt to deal with only three of these.

Uniqueness

THE FIRST of these, and they are not arranged with any idea of relative importance, is that we have a new grasp of the significance of uniqueness. In education, we have long given lip-service to the fact that all human beings are different. Anyone can see that they are, just by looking at them. But we have proceeded as though this were not so. Indeed, by trying to make people learn the same thing in the same way, we have tried to repeal or nullify the uniqueness which nature has gone to so much trouble to establish.

Nature has indeed striven for this accomplishment. Those who have studied biology know that heterosexual reproduction was hard to come by. This fact can be observed under the microscope in lower plants, such as spirogyra. Even more incredible than the mere fusion of two individuals is the formation of haploid reproductive cells. All of this is in order to produce an individual which is different in its very cellular structure from all other individuals. It is almost completely impossible, mathematically, for two individuals to be alike.

We have known for considerable time about the mechanical side of reproduction, how the chromosomes line up, and so on, although we have not seen the implications even of this for education. It seems as though we have thought, "That is biology, and not education." But when we see how it is that the perceptive process adds to what the mechanics of reproduction have already accomplished, we cannot escape the fact of complete uniqueness.

Nature obviously cherishes uniqueness.[9] We see now that the most important thing about any person is his uniqueness. If people were alike, no one would be able to contribute anything to anyone else. We need now to start

[9] Erwin Schroedinger, *What is Life?* (New York: Macmillan Co., 1946); Edmund Sinnot, *Cell and Psyche* (Chapel Hill), 1950, and Sir Charles Sherrington, *Man on His Nature* (New York: 1950), helped me to see the store nature sets on uniqueness.

cherishing uniqueness even as nature does, instead of trying to reduce or eliminate the learner's most valued possession.

Subjectivity

WE CAN now see farther into the matter of objectivity and subjectivity. Since we make our own interpretation of whatever impinges upon us, life is almost if not quite entirely subjective. What we know is not what the teacher taught us. When someone says, "Come, come, now, let's be objective!" or "Let's be realistic!" he reveals his notion that things are what is real, and that people do not modify them.

Knowledge

THE SUBJECTIVE nature of knowledge is something for the educator to conjure with. The philosophers have complicated the discussion of the nature of knowledge beyond all understanding by ordinary people. They have made it so complex that their ideas do not function in the daily lives of teachers and learners. Perhaps I am therefore justified in over-simplifying it. It will help us, I believe, if we define knowledge as *what we know after we have learned.*

If knowledge is what we know after we have learned, then it comes after learning, not before learning. It is a product of learning, not a pre-condition to learning. It is an outcome of perception, and is as unique and subjective as any other perception.

We are wont to think of knowledge as lying outside the learner, to be acquired by him in much the same manner as he might pick up any object with his hands, or as an amoeba might flow around a morsel of food. The difference is that when one picks up an object with his hands, it never becomes a part of him, whereas *when he learns, something new is built into the learner in the only way that it can be truly incorporated, that is, through his unique perceptive process.* As the individual learns, his experiences in the form of unique knowledge are built into structure, in the form of knowledge, attitude, habit, and so on. Since a man *is* what he *does,* these attributes are as much a part of structure as hand or foot. They are even more important than hand or foot because they have more to do with behavior. Indeed, they control behavior, and determine whether the hand shall be palm or fist. The oneness of the total human organism becomes easier to comprehend.

IF TEACHERS and educators were to become scientific, as we expect everyone else to be in these times, modification in method would be enormous. The new concept of the nature of knowledge alone would call for a whole new set of procedures, and of course different outcomes, since method and outcome are not a duality but completely related.

We would look to the learner to see what he is like and base our procedures

upon the situation revealed. Once a teacher was asked what he was going to teach during the coming session, to which he replied, "I don't know. I haven't seen my students yet." In the light of what has been revealed about learning, this makes sense, instead of being the babbling of one who should not be at large.

Having looked at the learner, we would derive what is to be studied from what we observe. There is no safe place to derive the curriculum except from the learner. Any attempt on the part of a teacher to decide by himself what is to be learned is bound to result in pure guesswork, with the teacher's desired ends being the ones which get consideration.

We would see learning as growth, and the function of the teacher as one who facilitates growth. We would then see the illogic in having our own ends paramount.

Art teachers would then avoid being copy masters, requiring children to draw or paint in accordance with the teachers' concept. They would see that the very meaning of art is the freedom to produce one's own concept, whatever it may be, and that whatever it is, if it is honest it will be different from the teacher's; and that this is creativity in action.

Indeed, if our perceptions did not come from us, all artists and designers would be in a bad way. If what lay outside the observer were what is real, then the artist would be obliged to produce externality exactly as it is. Artists would need great mechanical skill but no creativity. Paint brushes would have long since become obsolete, superseded by cameras. The "modern" artist, particularly, would have to mend his ways.

The lecture as an educative device would all but disappear. The lecturer chooses what he will expound, and since everyone in the audience is unique in what he can receive, the percentage of those who truly receive what is being put out is apt to be small. Since the listener is passive—nonparticipating—it is possible for him to turn off his attention even while appearing to be absorbed in what is being said. "A lecturer is one who talks in someone else's sleep." Education is communication, if any. The lecturer has no way to tell when he has become irrelevant, when his audience has left him, no device for getting back "on the beam."

Our use of books as learning devices would be revised. Books have great use because they make it possible to share the thoughts of those who are far away both in time and space. But they have been put to great misuse because they have become an end rather than a means in education. No book is a "good" in itself. Without the reader it is nothing. The reader has to put meaning into the printed word, else it has none. The reader can put meaning into reading matter only when he has something in experience and purpose to put into it. This is again a transaction, with author and reader being able to "transact" without being in the same vicinity. The printed word is not, however, the end

of education, but a tool, to be used when it serves a purpose at any particular time.

We will see the end of the process versus subject matter controversy. How we learn and what we learn are not separable. We cannot learn without learning something. We cannot just experience, we have to experience something. There is no such thing as process in the abstract, no such thing as teaching subject matter without a method however inept the method may be. It seems to me that every time we kill off a duality, life becomes more tenable, something becomes clearer. Since process and subject matter are not a duality, there is no longer need for strife over them.

IN FACT, what has been discovered in all fields concerning the nature of the human organism and how it learns is good news. It is good because coercion, so essential to the authoritarian, is not only unnecessary but useless. One might as well storm at his tomato patch because the plants do not grow.

It is good news because it supports the democratic ideal, which finds its best rationale in the uniqueness of the individual. Unique, creative individuals can thrive only in an atmosphere of freedom, and this atmosphere can exist only in a democratic climate.

It is especially good news for artists of all sorts, for if these things were not true, the artist could be creative only in a manual way, not conceptually.

When we learn to live together in school and out in accordance with what we now know about people, life will be better, and we will all, especially teachers, grow more human each year.

> Even though a speech be a thousand (of words), but made up of senseless words, one word of sense is better, which if a man hears, he becomes quiet. . . .
>
> Though a man recite a hundred Gathas made up of senseless words, one word of the law is better, which if a man hears, he becomes quiet.
>
> If one man conquer in battle a thousand times a thousand men, and if another conquer himself, he is the greatest of conquerors.
>
> THE DHAMMAPADA (trans. F. Max Muller)

PERCEPTION THEORY AND GENERAL SEMANTICS

F. P. KILPATRICK *

IN THE FOLLOWING remarks about perception and perceptual learning, I am acting largely in the role of a reporter. The point of view and research findings discussed here are a joint product of a number of us who have been cooperating in systematic perceptual research during the past few years. One of our groups is located at Hanover, New Hampshire, another at Princeton University, and another at the Naval Medical Research Institute, Bethesda, Maryland. Our investigations, for the most part into visual perception, have been systematic in that a particular theory of perception has guided the research—the theory which has been called "transactional."

As a result of earlier work, principally with the perceptual demonstrations designed by Adelbert Ames, Jr. [see 1, 4, 6],[1] it was proposed that perception might best be conceived of and treated as process. It was further suggested that perceiving is primarily a learned activity of the organism; that actions and their consequences as they are registered in relation to our motives or purposes are instrumental in the construction of what we see. It is our conviction that the perceptual organization of the moment cannot be an absolute revelation of what is, but is instead a sort of "best bet" based on past experience. This "best bet" based on the consequences of past dealings with our environment is reflected in awareness as perceiving, and serves as a directive for further dealings with the environment. Thus, we are motivated and behave in terms of the world as we perceive it, and *the world as we perceive it is in large part a product of our past motivations and behavior.*

* Dr. Kilpatrick, formerly of the department of psychology, Princeton University, presented this paper before the Second Conference on General Semantics at Washington University, St. Louis, Missouri, on June 12, 1954. He is now associated with a research corporation, National Analysts, Inc., of Philadelphia.

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[1] Numbers in brackets indicate bibliographical references at the end of this article.

We have often been asked the origin of the term "transactional" and why we use the word. We have borrowed the term from Dewey and Bentley [3] and we mean by it about the same thing that Dewey and Bentley do. They explain it in terms of the buyer-seller analogy, pointing out that it is impossible to define the functional nature of the buyer *as* buyer apart from his transaction with the seller, and that it is likewise impossible to define the seller *as* seller apart from the transactional nature of his relationship with the buyer. Similarly, we feel that the perceptual process can best be thought of as a transactional one. For example, such concepts as "organism" or "environment" seem to us to be static abstractions from a total process and may be properly understood only if it is remembered that each of them involves at least to some degree all aspects of the process.

Implicit in this theory as briefly outlined is a rejection of the usual sort of interactional analysis. By the usual sort, I mean the interactional analysis which implies independent entities with an organism on one side and an objectively definable environment on the other, with some sort of interaction occurring between the two. Our theoretical view does not subscribe to such a bifurcated universe.

Also in this theory is a rejection of the usual cause-effect analysis. We often slip into cause-effect analysis with its implications of independent entities and one-way relationships, but what we strive for is what might be called "except-for" analysis. "Except-for" analysis simply implies that we are trying to abstract those aspects of the total process "except-for" which the process itself would not occur as it does, and also, to the extent that we are able, to specify the role that such abstracted variables play in the process.

Suppose I set before you an object, for a example, a pencil, and you look at it and reach out and touch it. There is an almost perfect correspondence between your perception at one point in time, your action, and your perception at a subsequent point in time. But this tells us very little about the process of perceiving. Now, if I leave the pencil where it is and leave you where you are, but alter just one factor, and you now perceive and reach for the pencil in other than its true position, it seems fair to assume that the altered factor has played a definite and perhaps determinable role in your perceiving. However, it does not seem reasonable to say that the altered factor "caused" you to see the pencil where you saw it; it is merely one aspect which made a difference in a total process–an aspect *except for* which your perceiving would not have been organized in the way that it was.

Happily, in psychology as in other fields, when we have recourse to empirical demonstrations and experiments, much of the babble is stilled and common understanding advances one more step. The experiments selected for discussion here may conveniently be divided under three major headings: first, those concerned with the testing of what we have called "the hypothesis of equivalent

configurations"; second, those concerned with the effects on visual perception of what might be called "stress," "anxiety," or "insecurity"; and third, those concerned with the problem of perceptual learning.

The Hypothesis of Equivalent Configurations

STATED in its simplest form, the hypothesis of equivalent configurations proposes that for any given set of impingements on the organism (what is usually called a stimulus configuration), there is no one set of external circumstances which has to prevail in order to account for that particular set of impingements. Instead it is proposed that for any stimulus configuration, or for any combination of stimulus configurations, there is an indefinitely large class of environmental circumstances which could give rise to exactly the same set of impingements on the organism. It was to provide tests of this hypothesis that most of the Ames demonstrations were constructed.

The monocular distorted rooms [1, 4, 6] with which many of you no doubt are familiar, are a case in point. These rooms are so constructed that each part subtends the same angle at the nodal point of an eye placed at the observation point as would the equivalent part of a normal cubical room. In other words, each of the distorted rooms is constructed in such a way that it provides a monocular visual stimulus configuration almost exactly equivalent to that provided by a normal room with level floor, upright walls, level ceiling, etc. According to the hypothesis of equivalent configurations, one should be able to build all kinds of distorted rooms with sloping floors, sloping ceilings, different size windows, or walls at odd angles, and all of them should be seen as not at all unusual in shape when observed with one eye from the prescribed position. That is, in fact, what happens [7].

Of course, one may say that this is static one-eyed vision, and feel that the hypothesis would break down when applied to binocular observation or to nonstatic phenomena. That does not seem to be the case, however. We have carried our investigations into the realm of binocular vision and motion, and so far all the experimental evidence has been confirmatory. For example we have set up in our new demonstration center at Princeton University a set of two binocular distorted rooms of radically different sizes and shapes. They were constructed on the basis of a modified version of Luneburg's [8] mathematics of binocular vision. Our research has shown that these rooms are indistinguishable to observers viewing them with both eyes from the proper positions [5].

It is our ultimate aim, of course, to arrive at a completely general proof of the hypothesis of equivalent configurations. We feel that we have demonstrated it quite well for such visual cues as size, brightness, overlay, parallax, binocular disparity, and some others, but so far a completely general proof is lacking. It is only fair to point out that there is a possibility that when large numbers

of cues are integrated over time, they may combine in such a way that the organism is left with a unique solution. If it can be demonstrated that this is the case, then the hypothesis of equivalent configurations clearly is wrong. However, it seems to us that present evidence indicates that it is not wrong, and that probably a general proof can be reached.

WHAT, then, are some of the consequences if the hypothesis of equivalent configuration holds true? If it is true that an indefinitely large class of external configurations can give rise to equivalent stimulus configurations for the organism, it follows that what is perceived is not, and cannot ever be, an absolute and determined revelation of "reality"; instead what is perceived is somehow "chosen" from an almost limitless number of possibilities. Further it places in a central position in perceptual inquiry the question of how and why we "choose" to see the particular thing we do see.

Experimental work on this problem has led us to an explanation which runs along empiricistic lines. That is, we emphasize the learning aspect of perceiving. We feel that what is reflected in perception is primarily some sort of *weighted average of past experience which functions as a prognosis for the future* in terms of what the organism is trying to do.

We have reached the conclusion, we hope not prematurely, that all perceiving, even of the simplest objects, is abstractive in nature; and further, that what is perceived may roughly be described as a functional probability, a sort of best bet based on the individual's unique past experience as it relates to his purposes. It seems that the principles of abstraction, of indeterminacy, and of uniqueness of personal experience operative in the functioning of language are equally operative in the basic process of perception itself. From this point of view the chair itself can hardly be said to be more determined or less an abstraction than the word "chair." The territory may, indeed, be as deceptive and lead to as much misunderstanding as the map.

IF, THEN, we have no recourse to an absolute reality and must always deal in abstractions and probabilities, where lies the avenue of agreement and common understanding? Our demonstrations and experiments suggest that *absolute* perceptual agreement and *complete* understanding among individuals are impossible, but may be approached to the degree that relevant experiences are held in common. However, there are at least three major limitations on commonness of experience.

The first limitation is that two individuals cannot perceive the same set of events from the same point of view, simply because it is impossible for two individuals to occupy the same space at the same time.

The second limitation lies in the different rates and kinds of change occurring in the environment. It is possible for the same individual to have similar

experiences from time to time with a stone; and for two or more individuals to have similar experiences at the same time, or from time to time, with a stone. The probability of such similarities in experience is less, but still quite high, in the case of trees or flowing rivers. But it drops off sharply in the case of experiences with animals, and especially with humans in social situations where change, variability, and personal purposes are the rule. The stone you kick today behaves about the same as the stone you kicked yesterday. The man you kick today may react quite differently from the man you kicked the day before.

The third limitation lies in the cumulative or learned nature of perceiving. Differences in experiences acquired early in life tend to compound themselves because each new set of impingements from the environment is perceived largely in terms of what has gone before.

If such limitations to common understanding operate at the basic perceptual level, then it is no wonder we have trouble with our namings. However, I take it as a hopeful thought that, in the history of scientific inquiry, recognition of a barrier has almost always been merely the prelude to doing something about it.

NOW LET US consider for a moment another conclusion which appears to us to stem from the hypothesis of equivalent configurations. I have pointed out that if our analysis of the perceptual process is correct, there are no concrete absolutes in perception; that instead what is perceived may roughly be described as a series of functional probabilities. Others of our demonstrations suggest that these functional probabilities, despite their abstract and non-absolute nature, must be treated as absolutes in everyday behavior. We act in terms of the world as we perceive it, and we cannot "probably" act; we either act or we don't. Cantril has put it this way:

> While we may realize intellectually as scientists and psychologists that the happenings around us and our own perceptions, prehensions, actions and valuings are only probabilities, still we must behave in our everyday life *as if* some probable happenings are certainties. For we couldn't *act*, we couldn't survive if we did not make some definite fixed assumptions. For example, in carrying on the process of living, we have to assume as we are crossing a street, that what we perceive as an oncoming car *is* an oncoming car; we *have* to assume that certain friends *are* loyal, that certain people *are* honest; we have to assume that certain things *are* the right things to do and that certain things *are* wrong. Hence we tend to make absolutes out of probabilities in order to act effectively [2, p. 17].

Perhaps here is the key to an understanding of why people tend to treat words as things, as absolutes, and as constants. It appears to be a fundamental and necessary process, probably extending from the simplest level of object perception through the perception of people and groups. Thus, there is a continuity in this regard from objects, to naming, to stereotyping, to valuing, and probably even to such higher absolutes as faith in God or a hereafter.

Stress Experiments

STRESS is the name we have been using for another general class of phenomena with which we have been dealing in two groups of experiments. One group deals with the effects on perception of stress-like physiological reactions induced either by the inhalation of amyl-nitrite, or by cold pressor, a fancy name for putting one's foot in a bucket of ice water. The other group deals with perceptual situations in which psychologically induced stress might be presumed to be involved. Both sorts of stress seem to affect perception in similar ways in a great variety of situations.

Slack conducted studies, as yet unpublished, using the technique of one-dimensional tracking as a means of continuously recording alterations in perceptual-motor behavior. In testing the effects of cold pressor and amyl-nitrite, he found that both conditions result in a change in what is called the "range-effect," a change which might be described as a further regression towards the mean. In other words, subjects reacted less in terms of present happenings and more in terms of some sort of average of past happenings.

Another bit of research involved the use of aniseikonic glasses in the "leaf room." These glasses have lenses which alter the relative sizes of the retinal images in the two eyes, usually resulting in marked distortion in the perception of whatever is being viewed. For almost every observer there is an appreciable time lag between putting on these distortion-producing glasses and the appearance of any distortion of the object at which he looks, and even more time elapses while the apparent shape of the object gradually alters until it finally reaches a fairly stable maximum [4]. A device for measuring the speed and amount of this perceptual alteration of the appearance of a cubical leaf-lined room has been designed by Ittelson. One of the experiments in which it has been used also involves the use of cold pressor and amyl-nitrite. Both of these seem to result in an appreciable reduction in both the speed and amount of perceptual alteration.

In another experiment–this time with children–such glasses were put on the child and he was asked to look at both his parents and to describe how they looked. In a number of instances one parent was reported as distorting markedly in appearance while the other remained either normal or almost normal. Similar results were obtained when the children observed their parents in the monocular distorted room.

A study in the same direction, soon to be published, was recently completed by Wittreich and Gilder. They had observers look at normal people and simulated amputees while wearing aniseikonic size lenses. The results were unequivocal and in line with the investigator's predictions. The observers consistently reported seeing more distortion of the normals than of the simulated amputees.

A single generalization is suggested by these and related studies. The gen-

eralization is that whenever stress is aroused, the individual tends in his perceptual organization to resist the change called for by new impingements from the environment, and to hold on to a stable perceptual construct or constancy. *Under stress, the constancy which has proved reliable in the past is clung to, despite the fact that in the new situation, it is no longer reliable.*

This generalization appears also to apply to language; that is, under tension or stress people tend to hold on more strongly to common language forms, reifications, stereotypes, and familiar symbols, even in the face of what appears to be overwhelming evidence of their inappropriateness. Here, I believe, is a rich area for further research.

Perceptual Learning

WE HAVE utilized small monocular distorted rooms as perceptual learning and testing devices. As mentioned before, when the interior of a properly constructed distorted room is viewed with one eye from the proper position it is seen as being perfectly normal in shape. No amount of advance knowledge concerning the actual shape of the room and no amount of time spent in just looking at the static configuration is effective in altering the way in which it is seen. However, the observer can, through such means as tossing balls in the room or feeling around in it with a stick, learn to see more and more the true shape of the room [5]. Here we have an admirable device for studying the process of perceptual learning. This learned alteration is gradual, progressive, and measurable, making it possible to analyze the effects of systematically altering such variables as amount of practice, kind of practice, motivation, or amount and kind of conflicting cues [7].

One experiment in particular by Bagby seems highly relevant to the problem of language as it functions in human behavior. Two groups of subjects were used. One group was given no advance information at all concerning the distorted room. The other group was told, in considerable detail, the shape, size, and other features of the room prior to the learning sessions. Then all the subjects in both groups were given four identical series of learning sessions at the distorted room, records being kept of the speed and amount of alteration in visual perception of its shape.

Alteration in perception was significantly greater and faster for the naive, uninformed group. Indications are that the informed group would have caught up had the learning sessions been continued, but the results show that prior verbalization concerning the room had an initial inhibitory effect on perceptual learning. Perhaps there is a tendency to experience the world and the consequences of one's actions in relation to verbal categories and cognitive organizations when they are available, instead of in relation to sensory perceptual organizations. Apparently, too much attention to the map keeps one from learning the territory.

I SHOULD like to summarize by simply listing the propositions I have offered for your consideration.

1. All perceiving, even of the simplest objects, is abstractive in nature.

2. What is perceived is not, and cannot ever be, an absolute revelation of what is. Instead, what is perceived may roughly be described as a series of "functional probabilities," or best bets based on the individual's past experience as it relates to what he is trying to do. This point combined with the preceding one suggests that the territory can be as much a source of misunderstanding as the map.

3. Two or more people can never perceive in identical ways, and they perceive similarly only to the extent that their past experiences and purposes are similar.

4. Factors which limit similarity of experience include at least (a) inevitable differences in points of view in time and space, (b) the kinds of changes occurring in the environment and the different speeds with which they occur, and (c) the cumulative effect of experience on perception.

5. There is a basic tendency to treat whatever is perceived as both concrete and absolute, despite its abstract and non-absolute nature. To do otherwise is to inhibit the rapid and effective action necessary to the process of living. Perhaps this is the basis, also, for treating words as concrete and absolute.

6. Whenever tension or stress is aroused, the individual tends to resist the change in perceptual organization called for by new impingements from the environment, and to hold on to a stable perceptual absolute or constancy. Perhaps this resistance occurs also in language behavior.

7. Verbal categorization and cognitive organization tend to have an inhibiting effect on perceptual learning, at least in its early stages.

REFERENCES

1. Adelbert Ames, Jr., *Nature and Origin of Perception: Preliminary Laboratory Manual.* Hanover, N. H.: Institute for Associated Research, 1947 [mimeographed].
2. Hadley Cantril, "The Qualities of Being Human," *American Quarterly,* VI (1954), pp. 3-18.
3. John Dewey and Arthur F. Bentley, *Knowing and the Known.* Boston: Beacon Press, 1949.
4. W. H. Ittelson, *The Ames Demonstrations in Perception.* Princeton: Princeton University Press, 1952.
5. W. H. Ittelson and F. P. Kilpatrick, "Equivalent Configurations and the Monocular and Binocular Distorted Rooms," in F. P. Kilpatrick (ed.), *Human Behavior from the Transactional Point of View.*
6. F. P. Kilpatrick (ed.), *Human Behavior from the Transactional Point of View.* Hanover: Institute for Associated Research, 1952.
7. F. P. Kilpatrick, "Two Processes in Perceptual Learning," *Journal of Experimental Psychology* (in press).
8. R. K. Luneberg, *Mathematical Analysis of Binocular Vision.* Princeton: Princeton University Press, 1947.

SCIENCE AND COMMON SENSE

P. W. BRIDGMAN *

I SHALL have to begin by recalling some matters that have been said so many times that I can expect only to bore you, but this is a risk that I can see no way to avoid if I am to make my main point. You all know that, since the turn of the century, discoveries have been made in physics, culminating in the unlocking of nuclear energy in the atomic bomb, which have entirely revolutionized our outlook, not only our outlook with regard to the construction of the world around us, but our philosophical ideas as well with regard to our relationship to the world. It is the latter to which I would like to direct your attention.

The new discoveries that have forced the revolution were in the realms of relativity and quantum phenomena. We shall see later that the quantum phenomena were more revolutionary in their implications than the relativity phenomena, but historically it is probable that the relativity phenomena played the more important role at first. The new relativity phenomena were highly paradoxical and included such effects as meter sticks whose length changed when they were set in motion, clocks that ran slow when moving, and weights that became heavier when moving. In fact, these effects were so paradoxical and contrary to common sense that some physicists and most men in the street refused to accept them and even sought to throw them out of court by ridicule.

But the facts refused to be thrown out of court, and the paradoxes were resolved by Einstein's theory of restricted relativity. This theory embraced, in the first place, the mathematical machinery by which all the experimental facts were correlated into a single mathematical structure. But no less notable as an intellectual achievement and equally essential to the removal of paradox was Einstein's handling of the physical concepts that entered the mathematical edifice. It is this latter that is our concern.

There are two aspects of Einstein's handling of the physical concepts. There is, in the first place, a realization that the paradoxes involved primarily questions of meaning and that the common-sense meanings of such terms as *length* and *time* were not sharp enough to serve in the situations presented by the new

* Dr. Bridgman, exponent of the operational approach in the sciences, whose book, *The Logic of Modern Physics* (1927), has long been prescribed reading for students of general semantics, retired recently as professor of physics at Harvard University. He received the Nobel prize in physics in 1946. This paper appeared in *The Scientific Monthly* (June, 1954), and is reprinted by permission.

facts. In the second place, there was the method by which the necessary increased sharpness was imparted to the meanings. This method was to specify the operations that were involved in concrete instances in applying the term whose meaning was in question. For example, what do we mean when we say that two events are simultaneous? Einstein insisted that we do not know what we mean unless we can give some concrete procedure by which we may determine whether or not any two specific events are simultaneous. Analysis of the concrete procedures that we might use brings out the fact, not noticed before, that what we do to determine whether or not two events are simultaneous depends to a certain extent on the events themselves and is different and more complicated if the two events take place at different places than if they take place here. Furthermore, this analysis disclosed that what an observer does to determine whether two distant events are simultaneous is different from what another observer does who is in motion with respect to him. Simultaneity of two distant events is, therefore, not an absolute property of the events, the same for all observers, but is relative to the observers.

It is the same with length. What do we mean when we ask what the length of a moving object is? Applying the operational criterion of meaning, the meaning is to be sought in what we do when we measure the length of the moving object. When we analyze what we might do, we discover that there are several different possible procedures, equally acceptable to common sense. Thus, if we are asked to measure the length of a moving street-car, we might take an instantaneous photograph of it and measure the length of the photograph, or we might board the car, meter stick in hand, and proceed to measure it as we would any ordinary stationary object. If we get the same answer by the two procedures, we shall doubtless be satisfied and think that our catechizer was unnecessarily fussy in insisting that we tell exactly what we do to measure the length.

But here is where the new experimental facts come in that were not suspected before relativity theory. For it turns out that when we make our measurements with extreme precision, or when the streetcar is moving with very great velocity, the results of the two methods are not the same, so that the precise method must be specified if we want to talk exactly about the length of the moving car. In other words, it is ambiguous to talk about the "length" of a moving object until we have specified exactly how the length is to be measured; and when we have specified the exact procedure, the results we get are generally different, depending on what the exact procedure is. In particular, by one of the two procedures just indicated, the length of the moving car would be the same as when it is stationary; and, by the other, it would be less. We see at once that we cannot treat this situation by the methods of common sense and say that it is absurd that the length should change when the car moves, because it *must* change according to at least one of our possible definitions. Realization of this

at once removes the atmosphere of paradox from the statement that the length changes when the object is set in motion.

The precise way that we define length when the body moves is a matter of choice, and we will make our choice in the way most convenient for us in the light of all the experimental facts. It would take us much too deeply into relativity theory to attempt to see why the method that Einstein chose for defining the length of a moving object is, all things considered, the most convenient for the physicist. Suffice it to say that the method chosen was not the method that leaves the length unchanged by the motion, although such a method is possible and, for certain restricted purposes, might be considered more convenient.

Relativity theory has thus shown the importance of precision of meanings. It has disclosed that some of the apparently simple terms of common sense are actually complex when we attempt to apply them in situations beyond the bounds of ordinary experience. In these new situations, we are forced to make a choice between procedures that are equivalent in the ordinary range. The account we give of the new situation depends on the procedure that we choose—that is, on the meaning we give our terms. In discovering that in fact we do need to make distinctions of which we have never thought and which to a naive first impression appear a matter of indifference, we are discovering that in fact the world is not constructed according to the preconceptions of common sense.

THE SORT of phenomena with which quantum theory is concerned teach the same lesson as relativity theory, namely, that the world is not constructed according to the principles of common sense. However, the way in which common sense fails is somewhat different in the case of quantum phenomena. The unfamiliar world of relativity theory was the world of high velocities; the new world of quantum theory is the world of the very small.

Quantum theory began modestly enough with the discovery that some of the most familiar facts of daily life cannot be understood on the basis of the common-sense views of matter prevalent at the end of the last century. For example, it was impossible to understand why we cannot see a kettle full of boiling water in the dark. Common sense, when translated into mathematics, said that we should see it, but every burned child knows that we cannot. The paradox has now been removed from this and other related effects, so that we now understand, in a way that would have been incredible 25 years ago, most of the phenomena displayed by ordinary matter. This understanding has been provided by quantum theory. The theory is highly mathematical and it is well-nigh impossible to give an adequate outline of it in nontechnical language, but the one simple crude idea back of it all is that when we deal with very small things, such as atoms or electrons, the ordinary common-sense conception of *things* is no longer valid. The renunciation of common sense thus demanded by quantum theory is more drastic than that demanded by relativity theory. For

now we get ourselves into *logical inconsistencies* if we try to think of things in the microscopic domain in the same way that we think of the objects of ordinary experience.

Suppose, for example, that I have a box with a partition in the middle and one electron on each side of the partition. I remove the partition for a moment, so that the electrons have an opportunity to exchange positions. I now find when I replace the partition that I again have one electron on each side of the partition. It now involves me in logical contradiction to ask whether the electron that is on the right side of the partition is the same electron that in the beginning was on the right side, or vice versa. Neither can I ask exactly how fast is the right-hand electron moving. Knowing that the electron is on the right of the partition makes it logically contradictory to know how fast it is moving. These are indeed revolutionary restrictions. Not to be able to ask which electron is which means that the electron does not have identity, and not being able to ask how fast it is moving means that the common-sense categories of space and time do not completely apply to it.

Consider another example. It is possible to make a so-called electron gun with which a stream of electrons may be fired at a target. If we start with a comparatively crude gun firing a coarse stream of electrons, we find the stream of electrons behaves much like a stream of water from a hose, so that we cannot hit with it a single sharp point of the target, but there is more or less scattering. Now common sense might lead us to expect that our marksmanship would become better as we refined the apparatus by making it more and more delicate and capable of dealing with a finer and finer stream of electrons. Experiment shows, however, that our common-sense expectations are entirely wrong, and that matters get worse instead of better as we refine the apparatus. In the end, when we have, at great pains, constructed a gun capable of firing single electrons, we find that we have almost completely lost control of the situation. No two shots ever come alike despite the best we can do, and we might as well spin a roulette wheel to find what part of the target any electron will hit.

THE ELECTRON GUN illustrates the general principle that, in the microscopic domain, events cannot be made to repeat. The situation thus disclosed is bad enough from the practical point of view, but I believe that it is even more upsetting from the conceptual point of view. For the one intellectual lesson that science has perhaps most insistently underlined is that our mental machinery is capable of making mistakes and that we continually have to verify and check what we are doing. The fundamental method of verification is repetition; the repeatable experiment has come to occupy such a position that the very definition of truth is often framed in terms of verification by repetition. It looks as though it does not mean anything in the quantum domain to ask for the truth about any specific event, yet how can I get along without the concept of truth? You

may try to extricate yourself from the dilemma by saying that, although *I* may not verify the occurrence of some event by repeating the experiment, I *can* verify it by getting confirmation from some other observer who has also witnessed it. But this, unfortunately, is not a way out, because here we encounter another of those baffling properties of the microscopic world, namely, that an elementary event may be observed by only one observer. Confirmation by public report thus becomes impossible. To many, it might seem that thereby science is made impossible, science sometimes being defined in terms of publicity. However, if you are willing to grant that quantum theory is part of science, you see that matters are at least not quite as bad as this. Whatever the method by which eventually we get intellectual order into this situation, I think you can see that the observer must play a quite different role in the quantum domain than in the world of everyday life.

All these considerations mean that the conventional forms of thought are no longer applicable in the realm of the very small. I think you will agree that my foregoing statement is justified, namely, that the failure of common sense disclosed by quantum theory is more drastic than that disclosed by relativity theory. For, when in relativity theory we go to very high velocities, we merely encounter properties of matter that are strange to common experience, whereas when we go far enough in the direction of the very small, quantum theory says that our forms of thought fail, so that it is questionable whether we can properly think at all. One can imagine the consternation of our old philosophical friend Immanuel Kant who declared that space and time are *necessary* forms of thought.

What is the answer to the dilemma with which quantum theory confronts us, and where do the roots of the difficulty lie? Are we faced with the necessity of devising new ways of thinking? It does seem to me that eventually we shall have to find better ways of thinking, but I suspect that any improved method of thinking that we are capable of devising will eventually come up against essential limitations of some sort that will prevent its unlimited application. In the meantime, no agreement can be discerned at present among the experts with regard to the details of any way in which we might reform our thinking. As an example, there is the irreconcilable schism between the views of Einstein and Bohr on quantum phenomena. Whatever the eventual solution, I think we can at least be sure that it will be outside the realm of common sense. Furthermore, I believe the experts would at present agree that whatever new way we devise to think about the microscopic universe, the meaning of our new concepts will have to be found back at the level of the large-scale events of daily life, because this is the scale on which we live our lives, and it is we who are formulating the new concepts. This recognition and agreement entails, I believe, a consequence that is not commonly appreciated, namely, that the seeds and sources of the ineptness of our thinking in the microscopic range are already contained in our present thinking in the large-scale region and should have been capable

of discovery by sufficiently acute analysis of our ordinary common-sense thinking.

I would now like to direct your attention to some qualities of our ordinary everyday thinking that are commonly overlooked but seem to be beginning to attract more attention and, I believe, may eventually give us truer understanding of the nature of our thinking process and its limitations. What I shall now say must be taken as strictly my own opinions. I have no professional philosophical competence to speak on these matters, and it is even probable that many of my fellow-physicists would not agree with me, if indeed they have any opinion on these matters at all.

YOU HAVE all doubtless had some acquaintance with cybernetics, a subject named and largely created by Professor Norbert Wiener at Massachusetts Institute of Technology and you know how much attention this subject is attracting and how many people are working at it. Apart from any specific results that may come out of all this activity, such for example as discovering how to make bigger and better robots that will continually usurp more and more of the functions of human intelligence, it seems to me that the mere fact that so many people are concerning themselves with this subject is going to have important repercussions. For when so many people try so hard to make a machine that functions like the human brain, the point of view will gradually spread that the human brain is itself a machine of sorts. It will also be recognized that this machine must have limitations inherent in its structure, and that the things which the machine can do, including in particular thinking, is in consequence also subject to limitations. Thinking is done by the brain, and the presumption is that thought has characteristics imposed by the character of the brain. At any rate, we will come to see that we may not expect to understand the nature of thought at least until we understand the nature of the brain. If you ask why we should be concerned with the nature of thought, I would reply: the realization that the nature of thought is something which cannot be merely taken for granted is a realization that seems to be gradually dawning on us as we ponder the significance of our failures in the fields of relativity and quantum theory.

You will not, I think, ponder for long what limitations are imposed on thought by the structure of the brain until it will suddenly strike you that what is really happening here is that the brain is trying to understand itself. But is not this a brash thing for the brain to try to do, for how can the brain analyze its own action, when any conclusions at which it arrives are themselves activities of the very brain that was the original problem to understand? At the very best, the situation would seem to be somewhat strained and artificial, and you may perhaps anticipate that any conclusions at which we may arrive cannot have as simple and straightforward a significance as we had perhaps hoped. This does indeed seem to be the case. What we are encountering here is a special case of a system trying to deal with itself. Such situations occur not infrequently, and it

seems to be the general rule that such situations present special difficulties and infelicities.

Many of the well-known paradoxes of logic arise when a system tries to deal with itself. A stock example is the ostensibly complete map of the city in which the map itself is located. If the map is complete, it must contain a map of itself; that is, the map must have a map of the map, and this in turn demands a map of the map of the map, and you are off on a chase that has no end. Within the last few years, a theorem with regard to such a system has been proved, a theorem that has been hailed among logicians as a truly epoch-making discovery in logic. This theorem was enunciated by Gödel, now in the Institute for Advanced Study at Princeton. In very crude language, the theorem states that no logical system can ever prove that it itself is a perfect system in the sense that it may not contain concealed self-contradictions. This theorem, at one stroke, stultified the endeavors of some of the ablest mathematicians, just as earlier the discovery of new mathematical theorems had stultified the efforts of the circle-squarers and the angle-trisectors. Mathematicians had long been trying to prove by the principles of mathematics that mathematics contains no hidden inconsistencies, inconsistencies that some day might be discovered and bring down the whole imposing mathematical edifice in ruins. But Gödel's theorem showed that this is an impossible sort of thing to prove. The conclusion is that, if one wants to prove that mathematics is free from concealed self-contradictions, one has to use principles outside mathematics to prove it. If one then wants to prove that the new principles are free from contradiction, one must use other principles beyond and over those in question. We here encounter a regress that has no logical end and, humanly, ends in human weariness and the finite length of human life. This means that the human intelligence can never be sure of itself; it is not a tool capable of unlimited perfectibility, as is so often fondly imagined. All we can ever say is that, up to the present, we have found no inconsistencies where we have looked.

THERE IS one other recent development that tends to make us more self-conscious of our intellectual limitations. In Hanover, New Hampshire, Adelbert Ames, Jr., with a number of collaborators, especially A. Hadley Cantril, of the department of psychology of Princeton University, has been studying in recent years how the perceptions of different people adapt themselves to situations that have been purposely devised to differ from the situations ordinarily encountered in daily life. For example, one can play tricks with perception by making lines converge or diverge which ordinary experience leads one to expect must be parallel. By combining various kinds of motion with curiosities of perspective, one can produce sensations completely foreign to ordinary experience, which the unaccustomed brain fits into its perceptual scheme in forced and unnatural ways. A striking example is the so-called trapezoidal

window. A wooden frame like an ordinary window frame, except that the top and bottom sashes are not paralled, is rotated uniformly about a vertical axis. When the narrower end of the frame approaches the observer, the converging lines, associated ordinarily with greater distance, present the observer with an unaccustomed dilemma. Most observers resolve the dilemma by seeing the window frame in oscillating motion, back and forth, rather than in uniform rotation. In general, the way in which the observer perceives this and other strange situations varies with different persons and even varies with the same person, depending on what has been happening to him in the immediate past. This means that what a person sees in a given situation may, to a certain extent, be manipulated and controlled by another person.

Of course, there is nothing new in illusions. At Hanover, however, the study of such effects is being elaborated into a systematic technique for finding out about the nature of our perceptual processes. I think that most people, once they have seen the demonstrations, would be convinced that such studies cannot help being of great value in revealing details of the ways in which our perceptual machinery works.

Personally, however, I find these studies tremendously suggestive and stimulating from a point of view of greater generality, namely, in emphasizing the significance of the mere fact that we perceive at all. This is one of those things that are so universal we never think of them unless our attention is forced by some dramatic situation. Perception we have always had with us and we take it completely for granted. We *see things* out there in space moving about, and that is all there is to it. We accept these perceptions at their face value and, on them as a foundation, we build the pattern of our "reality." To this reality, we ascribe an absolute existence transcending its origin and ask ourselves how it is that the human brain can be capable of apprehending the absolute. By asking this question, we disclose our hazy feeling that what a brain can do is probably limited in some way. But except for this hazy feeling, it seems to me that the question is improperly put, and the fact that we ask it discloses an improper attitude on our part. Instead of asking how human brains can apprehend "reality," we should ask what sort of thing it is that the human brain can fashion to call reality. It was, I believe, Suzanne Langer who remarked that philosophy advances, not by finding the answers to the questions of preceding generations, but by finding that those questions were improperly put. Here it seems to me is obviously a question that has been improperly put. The perceptions of time and space have been furnished to us by the machinery of our nervous systems. This machinery is a terribly complicated thing, which in spite of its complication does not give rise to perception until it has received a long course of preparation and education. Anyone who has watched a small infant trying to coordinate its visual and tactual sensations recognizes that we acquire our perceptual abilities only by arduous practice. Yet we take our space and

time with a deadly seriousness. Even so great a scientist as Sir Isaac Newton could say that space is the sensorium of God, and nearly every philosopher treats thought as in some way transcending the machine that thinks. It will doubtless be disturbing to many to give up our transcendentally fundamental time and space, but I think there is perhaps something to be gained also. Perhaps when we learn to take them less seriously we will not be so bedeviled by the logical contradictions in which they sometimes now involve us, as when we ask questions about the beginning or end of time or the boundaries of space.

There is another respect in which I have found the experiments of Ames most stimulating, namely, in disclosing details of our mental processes of which we are ordinarily completely unaware. For example, as one watches the rotating trapezoidal window, one's perceptions are in a continual state of flux, melting and forming and metamorphosing into one another in a way quite unfamiliar. How can one find words to describe such unfamiliar happenings, or how can one catch and hold such things? How can one even store in memory what he has experienced so that he may be sure that the manner of fusion of two perceptions which he has just experienced is the same as the manner of fusion which he experienced yesterday?

OF COURSE, ever since psychoanalysis started, we have known that there are processes occurring in the brain that never get to the level of consciousness, but here it seems to me that we have something different, because here we are encountering new sorts of conscious experience. Among these, there are *transient* mental phenomena, accessible to sufficiently acute introspection. For example, as we listen to our fellow, the meaning that he is trying to convey grows before it is complete. Meanings do not spring full grown into our minds but pass through a stage of development that is seldom, if ever, the subject of analysis. It seems to be a general characteristic of our mental processes that we like to operate with static and complete things—we want our words to have fixed meanings and we analyze space into points and time into instants. But to sufficiently acute analysis, the fixed and static does not occur—it is something that we have constructed, and in so doing we have constructed away a whole world of mental phenomena.

It would seem not impossible that this world of transient phenomena and fine structure could be recovered and opened to us by deliberate cultivation and invention. What is needed is the invention of an introspectional microscope. Not until we have amassed a considerable experience of this world will we be able to talk about it or even remember our experiences. Gaining mastery of the microscopic world of introspection will involve much the same sort of thing that happens to a baby or to a kitten when its eyes are opened. Study of the process of gaining mastery of the new introspectional world may help us to reconstruct imaginatively what happened to us in our own babyhood.

It does not yet appear what the final method will be for dealing with all these considerations. I believe that the final solution will have to carry further the consequences of the insight that quantum theory has partially glimpsed, namely, that the observer must somehow be included in the system. The point of view of classical physics, and I believe also of all orthodox human thinking up to the present, was that the observer is a passive spectator, expressed sometimes by saying that what he observes would be the same whether he were watching or not. Quantum theory points out that this is only an approximation valid in the realm of large objects. The very act of observing a small object involves a reaction between the object and the observer, a reaction that must be allowed for in reconstructing the system from observation. To which we now add the insight that the relationship between the observed and the observer is a much more intimate relationship than these quantum considerations would suggest, and that it is in fact meaningless to try to separate observer and observed, or to speak of an object independent of an observer or, for that matter, of an observer in the absence of objects of observation.

It seems to me that our eyes are gradually opening. We are coming to recognize that it is a simple matter of observation that the observer is part of what he observes and that the thinker is part of what he thinks. We do not passively observe the universe from the outside, but we are all in it up to our necks, and there is no escape. It would be difficult to imagine anything more contrary to the tenets of common sense or to the attitude of the human race since it has begun to think. The common-sense way of handling our minds has, without doubt, been of decisive importance, and the discovery of the common-sense way of thinking was, doubtless, in the beginning a bit of an invention, perhaps the most important invention ever made. One of the things that we are in fact doing in accepting the common-sense way of thinking is to declare that, for our purposes, we do not need to complicate our thinking by continually holding ourselves to an awareness that the thinker cannot be divorced from what he thinks. We have thus brought about a tremendous simplification in our intellectual processes, and in the history of the human race the common-sense attitude has been more than justified. It seems to me, however, that we are approaching a position where we can recognize the limit of usefulness of this way of thinking. Common sense evolved in the comparatively simple situations of the primitive experiences of the human race, and although it may have been an invention, we may be sure that it was an unconscious invention, adopted with no due consideration of its limitations or possible alternatives.

The world with which common sense was evolved to cope was simple with respect to the range of physical phenomena that it embraced, and simple also with respect to the social organization of the communities in which common sense was practiced. In the last 50 years, we have drastically extended our physical range toward high velocities and toward the microscopic and have been

able to retain our command of the situation only by discarding those common-sense methods of thinking about physical things which had served the human race from the beginning. We may well ask ourselves whether something analogous may not be expected to occur, or is not in fact already occurring, when we pass from the simple to the complex in phenomena other than those of the physical world, using *physical* in its narrower sense. There are at least two other classes of nonphysical situations. These are social situations and the situations presented by the creation of abstractions or by abstract thinking. Consider first the social situations.

THERE WILL BE, I suppose, no disagreement with contention that, in the last few generations, the complexity of our social environment has tremendously increased. With modern methods of communication with the speed of light and of transportation with more than the speed of sound, the social environment of each person is becoming effectively the whole world. Plain analogy with what has happened in physics suggests the question of whether we are not here encountering an extension of range in our social experience that will demand an analogous abandonment of common-sense methods of social thinking. By common-sense methods of social thinking, I mean those methods that developed in small communities and are fitted to deal with nothing more complex than the social situations presented by small communities. From this point of view, most of our social thinking would seem to be of the common-sense variety. One characteristic social attitude springing from such an origin is the conviction that there is one and only one "correct" or "right" social philosophy or world-view, or one line of conduct that one "ought" to follow. Such a point of view could be pretty well maintained in a community small enough to offer a background of uniform social experience to all its members and able to enforce conformity on all dissenters. But the impossibility of any such view has become amply apparent when the community has become the whole world, and we are forced to revise the very meanings that we attach to *truth* or *right* or *ought*. It would appear that there is a moral perception analogous to our physical perception of objects in space and time and, like our physical perceptions, dependent on our past experience. We may suppose that the savage, who has never seen a civilized window frame, when confronted for the first time with the rotating trapezoidal window, will see it, not in oscillating motion as we do, but in uniform rotation. Analogously, the Hindu, brought up in the religious traditions of his group, perceives as a moral imperative that he must not kill the mosquito that annoys him. The realization of this is not new; the anthropologist has been dinning it into our ears for some time. The anthropologist, however, could point his moral only in somewhat academic terms and mostly from the record of the past by presenting us with the divergent practices of different peoples in different epochs. The lesson is now pointed with incomparably more dramatic force in our en-

deavors to find a basis for the harmonious living together of the entire world, a problem that demands the simultaneous reconciliation of so many divergent outlooks. At the very least, we shall have to evolve a new social philosophy and discover some method of getting rid of the provincialism that seems so right to common sense.

In addition to the social situations, a second nonphysical factor in our lives is afforded by our abstract thinking. How long the human race has been thinking and talking abstractly I suppose even the anthropologist cannot tell us, but it appeals to me as a good guess that we developed our common-sense method of handling the situations of daily life before we began abstracting. It is known that there are primitive peoples that have not yet formed as simple abstractions as "tree." The extension of thinking from concrete objects to abstractions constituted an extension of range sufficiently great to suggest the question, inspired by our experience with relativity and quantum theory, of whether the methods adequate to deal with the world of concrete objects continue to be adequate to deal with abstractions. To put the question is to suggest the answer. In the answer, I believe we can glimpse the solution to a riddle that has long baffled us. There is a class of people whose profession is to deal with abstractions—that is, the philosophers. By long tradition, philosophical thinking has come to be regarded by most people as the most exalted of all thinking, and the philosopher is often regarded with an approach to veneration. But along with this veneration most people are disillusioned and feel the futility of the whole philosophical enterprise, because after 2000 years of argument philosophy has settled no questions and no two philosophers agree. This situation can be understood in a measure when we recognize that the philosopher essentially is applying to abstractions the same common-sense methods that are applicable in the realm of concrete objects. I think simple observation of any conventional philosophical system will justify this statement, or, if one wishes, one can find a formal argument by Philipp Frank to show that the theses of philosophy are essentially the theses of common sense extended into the realm of abstractions. For example, Plato ascribes to ideas a reality like the reality of the objects of common sense. But ideas are not like things, and to treat them like things is only a kind of poetry. The cure for the common-sense attitude toward abstractions is to seek the meaning of our abstract terms by an analysis at least as searching as the analysis that we have been forced to apply to such simple physical terms as *length* or *time*. Such an analysis is seldom applied to abstractions, but the common-sense implications in our verbal habits are uncritically accepted. For example, one of the great abstractions is truth. In talking about truth, one uses such expressions as *the* truth, or thinks of truth as eternal in the heavens, which all may know and on which all can agree. But just as in physics we have been forced to recognize that there is not the one length of common sense but different kinds of length, such as optical length or tactual length, depending on our

choice of method of measurement, so analysis will disclose that there is not just the one truth of common sense but different kinds of truth, depending on the method used for establishing "truth." For example, scientific truth is not the same as theological truth, and we must not talk about them as if they were and as common sense wants us to. Since truth is such a frequent topic for discussion in philosophy, this one example will suggest the modifications in conventional philosophical thought that might follow the abandonment of the common-sense attitude toward truth. Perhaps the philosophers might even agree. Even if the philosophers prove unregenerate, outside the realm of philosophy abandonment of the common-sense attitude toward truth will go far toward eliminating bigotry and intolerance.

IN CONCLUSION, the problem of devising successful substitutes for common sense has not yet been solved, and we are standing only on the threshold of a new era in human thought. Although the final solution is not in sight, there are certain lessons that we can take to heart at present in the expectation that we shall not have to retreat. It seems to me that, as a minimum, we henceforth cannot regard a man as well educated who does not intuitively recognize that common sense is not to be taken for granted, or who does not handle his thinking as a tool in the awareness that every tool has limitations built into it. Such a man, looking to the past, can only be amazed that the human brain has, by cut-and-try methods, evolved procedures as effective as it has for dealing with the world around us; looking to the present, sees perhaps the most important reason for the present internal social difficulties of the human race in its uncritical use of traditional habits of thought; and looking to the future, can feel only optimism for the time when we shall have learned how to substitute consciously directed control of our thinking for the blind procedures of common sense.

> But the real meaning of a word appears when the word is uttered and functions in the human activity called speech. Hence we must know who says it to whom, when and where. Which indicates that meaning, like all things human, depends on circumstances. In the operation of speaking—that is, communicating through words—what we call language forms only one, if a relatively stable, constituent which must be supplemented by the vital setting.
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> JOSE ORTEGA Y GASSET, *Concord and Liberty*

TOWARD A HUMANISTIC PSYCHOLOGY*

HADLEY CANTRIL †

IN A RECENT discussion of "The Task Before Us," the physicist P. W. Bridgman has lamented the humanistic interest of many American universities as merely a "return to" without any "notable revitalization of these humanities themselves in the light of our recent intellectual experiences." Bridgman continues, "It seems to me that in this cry for a 'return' there is grave danger that we shall turn our backs on a job which not only is not finished but which is hardly begun. This job is to assimilate into our whole intellectual outlook, and in particular into our relation to social problems, the lesson implicit in scientific experience." [1] [1] We should perhaps bear in mind throughout the discussion an important differentiation between the humanistic and scientific approaches: that the latter is developmental and additive, attempting to build on increasing data to reach more adequate conceptualizations. But just because of this, there is no reason why the "humanist" need feel apologetic, modest, or in any way be on the defensive for his insights and expressions.

The problem is nicely posed in the recent *Dialogues of Alfred North Whitehead* as recorded by Lucien Price. Whitehead is asked the question, "Why should science be able to take such leaps, as it has done in the last century, even the last forty years, when the humanities advance so slowly? Are we really much ahead of Plato and Aristotle there?" To which Whitehead's reply was, "In the eighteenth century (I speak of England where I know what I am talking about)

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[1] Numerals within brackets, whether in text or footnotes, indicate references listed at the end of this article.

you could follow Rome and Greece of their best ages. The social structures were similar enough for historical precedents to be of some practical value: you still had the mob and the aristocrats. If it was a question of governing a colonial empire, India, you could still follow your Roman model; if a colonial governor was brought to trial for maladministration—Warren Hastings—you had Cicero's orations against Verres for his rapacious governorship in Sicily . . . Even in the nineteenth century the Graeco-Roman model would still be fairly closely patterned after. But now, in the twentieth, this new technology has so altered the moral values, or the social relationships, that a much more searching and subtle readjustment of the traditional classic models to modern needs is wanted. . . . We are sending out as colonial administrators men trained not in the old humanistic tradition, but products of the scientific schooling. They are just as good intellects, but is their training as happy? I doubt if they will bring as sensitive an understanding to the emotional set-up of the peoples they must rule." [2]

I SHOULD LIKE to take the liberty here to spell out a point of view which a group of us are developing and which we have labeled "Transactional Psychology," borrowing the term "transaction" from John Dewey. It is my hope that a brief discussion of the main premise of this point of view may serve as a catalyst for discussion among general semanticists. For it does seem to me that the way in which we are now trying to look at "experience" and "behavior" includes the possibility, indeed the necessity, of taking into account in any psychology that pretends to be adequate those problems which are common problems to the humanist and the true scientist.

The ultimate goal of psychology is the understanding of human living so that individuals can live more effectively. The psychologist's aim is that of formulating a set of constructs which will enable him conceptually to "understand," "explain," and "predict" the activities and experiences of the functional union we call a behaving person.

A prerequisite for psychological research is an understanding of what an individual is aware of from his unique behavioral center in any occasion of living. The word "center" is used here in the dictionary sense of "the point toward which any force, feeling or action tends or from which any force, or influence takes its origin; as a storm center" (*Webster's Collegiate*, 5th ed.).

The psychologist interested in understanding the process of living must start from naive experience in the phenomenal area. For only then will he be able to undertake investigations that will disclose the nature of the processes playing a role in behavior which the experiencing individual is taking account. The words "experience" and "behavior" are used here as *interdependent* abstractions man has created, neither of which would be meaningful except for the other.

As anyone knows, the task of starting with naive experience and formulating systematic constructs on the basis of naive experience is a particularly difficult

undertaking. For the very essence of living is its unity and flow. Yet in order to get any grasp of his most complicated subject matter and to communicate his understanding to others, the psychologist is forced to break up into distinguishable parts what really constitutes an indivisible, functional aggregate; he is forced to consider separately the various aspects of living which are all interrelated and interdependent and none of which would function as they do except for all the others. The various aspects of living that are experienced are never separate from each other but fuse together to form this living. And the psychologist must try to orchestrate into a single symphony the harmonious or discordant sounds with motifs, themes, phrases, accents, and repetitions related to the separate notes played by the many instruments.

IF THE PSYCHOLOGIST, then, is to be faithful to his subject matter, he must always bear in mind that living is an orchestration of on-going processes and that any process he may choose to differentiate out of this aggregate of on-going processes of living can be understood only if it is recognized as referring to a phase of man's orchestrated functioning. It is, for example, a commonplace of philosophical and psychological thinking that "cognitive" and "motor" processes are themselves distinctions that can be misleading unless there is full cognizance of the fact that there can be no "knowing" without "doing," just as there can be no "person" except for an "environment," nothing "subjective" except for what is "objective," nothing "personal" except for what is "social," nothing experienced as existing "out there in its own right" except for the organizations and significances to an individual of the happenings going on in the world around him which he associated with light waves, sound waves, etc., as instruments of explanation.[2]

[2] This is, of course, by no means a new emphasis. It runs through William James and was clearly expressed by John Dewey in his memorable address in 1896: "The older dualism between sensation and idea is repeated in the current dualism of peripheral and central structures and functions; the older dualism of body and soul finds a distinct echo in the current dualism of stimulus and response. Instead of interpreting the character of sensation, idea and action from their place and function in the sensory motor circuit, we still incline to interpret the latter from our preconceived and preformulated ideas of rigid distinctions between sensations, thoughts and acts."

In giving a list of ideas he rejects, Korzybski names, among others, "elementalism" which he defines as "the assumed sharp division of 'senses' *and* 'mind,' 'precept' *and* 'concept,' 'emotions' *and* 'intellect,' etc." [4] He proposes instead a "non-elementalistic theory of meanings" based on a "psycho-physiological theory of semantic reactions" of the "organism-as-a-whole." [5]

The same point of view has been more recently elaborated by Dewey and Bentley [3], who used the term "transactional" to refer to the relationship between the processes involved in human behavior in contra-distinction to "interaction" and "self action" which have so affected much psychological thinking. While we have also used the term "transactional" as it is commonly employed in everyday life with reference to our interpersonal

It is important in any consideration of "moral ideas" to re-emphasize this point, to indicate some of the different experiential aspects into which the process of living may be abstracted, to show how each aspect plays a functional role in the congregation of experience and cannot be regarded as a single mechanistically-caused variable.

A necessary part of our consideration is, of course, that the conceptual abstractions we use are several steps removed from our primary data, namely, naive experience. In order to bridge the gap between naive experience and conceptual abstractions, the psychologist must consider areas of complexity and abstraction that become progressively further removed from his first-order data. It is imperative that any investigator be aware of the level of abstraction at which he operates. For there is always the danger that anyone, especially the scientist, may tend to mistake the conceptual abstraction for what it refers to, embrace it eagerly because of the feeling of security it affords, forget that it obscures uniqueness and differences, that it is a function of some human purpose and is at best partial and tentative.

Any such approach to the study of man's values and ideas is automatically denied us if we follow certain current "schools" of psychology which, stemming from the scientific tradition set by Descartes, attempt to explain the nature of man entirely in terms of a mechanistic determinism. This does not in the least, of course, imply that we turn our backs on the results of rigid scientific experimentation. Indeed, the most rigorous of these as found in modern physics support the conclusion that our traditional conceptions of matter are due for serious revision and, further and more important for us here, the conclusions of modern physics as well as modern biology deny any complete determinism and indicate that what makes up the universe, including man, is ceaseless activity, continual flow from form where the spirit of man plays a creative role.

Different Ways of Viewing Experience

It may be helpful for us in setting the stage if we differentiate between four different ways in which experience may be viewed, four differentiable areas of complexity.

A. *On-going, naive experience*

This is the level of immediate, "pure" experience as experienced—unanalyzed, unconceptualized, unmediated, and with no concern on the part of the experiencing individual to describe, analyze, conceptualize, or communicate his experience. This on-going, naive experience is what Korzybski called "first-

dealings, it is hardly inclusive enough for our purposes, chiefly because it leaves out the novel aspects of living. But for psychological description, however, the term "transactional" does seem useful in referring to the variables we describe below that are involved in the orchestration of man's experience and except for which there would be no real "transaction of living."

order" or "objective level" or "un-speakable" experience. He writes: "Thus we *handle* what we call a pencil. Whatever we *handle* is un-speakable; yet we *say* 'this *is* a pencil,' which statement is unconditionally false to facts, because the object appears as an absolute individual and *is not* words." [6] This is perhaps what the poet Wordsworth had in mind when he said, "We murder to dissect."

As has been frequently pointed out, any attempt to describe or analyze experience immediately alters that experience. When we are trying to describe or analyze experience or any aspect of it, we are functionally organized quite differently than when we are participating in a process of living and are not describing or analyzing it. Our experiences in the occasions of living are dependent upon and characterized by processes involving, for example, overtones of satisfaction or dissatisfaction, a sense of involvement and responsibility, a sense of intent or aim, commitment through activity, a sense of worry, frustration, or urgency, a sense of despair, hope or faith, etc., depending upon the particular orchestration going on in a particular unique occasion of living. The obvious complexity of the orchestration that any on-going experience *is* makes the process of isolating aspects of it particularly difficult. But if the psychologist ignores any significant aspects of experience in an attempt to isolate easily manipulable variables, he is bound to fail in his attempt to understand that experience.

B. *Description*

VERBALIZATION and communication, either retrospectively or simultaneously with the occurrence of some experience, may be distinguished methodologically from naive experience itself because of a form of awareness on selected aspects of experience. For some focusing, categorization, and coding are operating in the process of dealing consciously or verbally with any selected experiential aggregate. It is as if with any such focusing, awareness is shifted from the full orchestration as a whole to the role of a particular instrument in the orchestra.

As stated by Korzybski: "Animals may 'feel,' and 'suffer,' but they cannot *describe*. Humans differ in this respect; the given person may feel pain, the pain is very *objective* to the given individual, but it is *not words (objective level)*; but we can describe it, this description being valid on the *descriptive level*, a higher order abstraction than the objective level (which is un-speakable for the given individual). If we *ascribe* this process to others, this is no longer a description but an inference, or a still higher order abstraction. . . ." [7]

It is important for psychologists using descriptive material of any kind never to lose sight of the fact that reports of experience are not to be equated with experience itself. Such "protocol" data, however, do provide the psychologist with valuable raw material. This is not limited to introspective reports obtained in the laboratory or to clinical material. Some of the most penetrating descrip-

tions of experience have been given us by poets, novelists, composers, and religious prophets. From this point of view, the psychologist concerned with an understanding of the full range of human experience can enormously benefit by sensitizing himself to the insights found in the "humanities." [3] The humanists, on the other hand, as already indicated, should be able to profit by keeping in touch with the psychologist who, in his self-appointed capacity as scientist, must try to systematize the intuitive portrayals of humanists and formulate constructs of general validity.

C. *Focused analysis and conceptualization*

INSTEAD of focusing on a selected phenomenon in an experience of living we may, in the midst of that living, try to "figure out" conceptually what is going on. We do so for some purpose. Perhaps we are trying to resolve some personal problem, perhaps we are delving into our own experience in the hope of discovering hunches or clues that will provide us with some hypothesis, or perhaps we are only obeying the instructions of some experimenter in the psychological laboratory. Analysis of any occurrence for whatever purpose is a very different experiential aggregate than purposive behavior itself or focused aspects of it.

This area of complexity described as "focused analysis and conceptualization" also includes our attempt to understand the behavior and purposes of other people as we try to carry out our own purposes in social situations. Such understanding will usually be successful insofar as we are able to bring to an occasion appropriate sets of abstractions derived from our own experience. Our ability to "put ourselves into another's position" and to "share" his experience vicariously seems generally to depend upon the similarity of our experiential backgrounds, our purposes, our standards for sensing satisfaction, our values, etc. In other instances, where there may be little similarity of experiential background, our understanding of others may increase if the situation is such that we develop with those others some community of interest through the repeated sharing of new experiences.

No matter how close the correspondence may be between all the factors involved in giving us an awareness of another person's experience under certain circumstances, we still have to interpret their experiences in terms of our own

[3] Henry A. Murray has pointed out that: "Until theory has been much further developed we would be inclined to favour the use of clear literary language, despite the current tendency among American psychologists to become suspicious whenever there appears in the writings or speech of a fellow-scientist the slightest trace of aesthetic feeling. A psychologist who believes that he can tell the truth without being 'literary' has only to try writing a case history or biography, and then compare what he has done to a character sketch by any novelist of the first order. We academic psychologists have yet to discover how much can be learnt from the realists of literature. A little humility here would add to our stature." [8]

experience. And no matter how closely-knit the person may feel in the social group, no matter how great the correspondence may be between his experiential background, his needs, his purposes or values with those of other members of the group, his experience of participation with the group is still uniquely his own. Complete understanding of another person is an unobtainable ideal.

Yet our understanding of another person (or his understanding of us) may be more accurate than his own understanding of himself since our "explanation" of his behavior may be taking more factors into account, may give very different priorities to different aspects that constitute the aggregate experience, may differentiate or abstract out of his process of living as we observe it more intrinsically reasonable aspects so that we are more aware of the processes playing a role in his behavior than he is himself. Thus an experienced physician will be able to tell us why we are tired or suffer certain aches or pains; an experienced psychiatrist may be able to point out to us what purposes that we are unaware of seem to be guiding our actions; a wise friend may be able to point out contradictions in our value-standards, etc.

D. *Abstracting for scientific specification*

THE SCIENTIST'S attempt to understand the nature of human living is ultimately an attempt to distinguish components, to choose those by means of which he will be able to define and interpret the significance of any process of living, and to describe the variables on which the singularity of any process depends. If the abstracting a scientist makes can be effectively related to his presuppositions, then he will have an instrument to render communication more accurate and to enable others to understand the abstractions without reference to any particular item of behavior that might illustrate it. This point is discussed at length by Korzybski in his treatment of "higher inferential levels" in his chapters "On Abstracting," "On the Structural Differential," and "On 'Consciousness' and Consciousness of Abstracting." [9]

Such scientific abstractions are not affected by individual behavior and are not altered when conceptualized from the point of view of different persons. If they were so affected or altered, they would prove useless; it is their static quality that gives them the utility they have in understanding the significance of concrete behavioral situations. This does not mean, of course, that such scientific abstractions never change. They are, on the other hand, constantly evolving and being modified by scientists themselves to increase their usefulness. The creative scientist tests his abstractions by their performance, not be their consistency, realizing that any abstraction is highly tentative. In describing William James, Whitehead wrote, "His intellectual life was one protest against the dismissal of experience in the interest of system." [10] What we mean by the "static quality" of an abstraction is simply that scientific abstractions would be operationally useless if their significances were not "fixed."

But it should be emphasized again that when we are dealing with this fourth area of complexity which makes scientific communication possible, we are necessarily violating phenomenal data. The psychologist's awareness of this fact and of some of the omissions involved in operating in this area should help give him perspective to increase the usefulness of his abstractions.

TWO POINTS should be noted in passing with respect to this four-fold differentiation: (1) whichever way a process of living is considered will depend upon one's purposes, and, (2) no matter which way a process of living is considered, the consideration is still yours, is still a process in which you cannot be detached, is still a transaction involving what Bridgman has called the "personal equation" from which no scientist can escape. All experiences are from a personal behavioral center.

A major task, then, for anyone trying to work through an adequate understanding of human nature is to describe what a transaction of living *is* in all of its aspects from any personal behavioral center. Since experience is "real" only insofar as it is "yours," we must try to make an approximate description of a transaction of living that will appear intrinsically reasonable and verifiable in terms of your own experience and behavior. Such a description, of course, must be derived from an analysis of your own experience and behavior, which is all you have to base it on. This means that we must work out from what is given in a transaction of living rather than work in toward a transaction of living from some arbitrary outside starting point, such as any pre-established abstractions or any pre-established methods borrowed from another discipline.

The psychologist cannot avoid his responsibilities merely by becoming insensitive to the compelling aspects of human experience which defy neat systematization or the use of picturesque models which can be quantitatively described. If, for example, we take the more traditional, "scientific" point of view alone and try to account for another person's experience and behavior, we are likely to over-emphasize the aspects of any transaction of living which have been determined in the past. For from this point of view—e.g., from the past—since we are *outside* the personal behavioral center which is our object of understanding, we ourselves cannot possibly participate as another individual is himself participating in what is to him a "now" or "present" where *he* must make *his* choices in order to carry out *his* purposes in a situation that impinges upon *him* and in which he initiates some action that is, in part, pushed by a determined, repeatable past and in part pulled by an undisclosed, uncertain future. Likewise, from the "objective," "outside" point of view we may entirely neglect the experiential background and the past interpersonal relationships that bring to an occasion of living a determined set which affects the direction that occasion of living will take. We then land in the complete situational determinism "outside of us," a metaphoric "field" theory and cannot account for the

consistency of behavior, the apparently directed flow of living, or the value overtones without which any transaction of living would not be what it is.

IT IS perhaps especially worth noting in a discussion of the ways in which "experience" can be viewed that, as William James long ago emphasized, the range of our awareness is most restricted. Your awareness is an attribute of a transaction of living which refers to a very limited and particular range of "things" (objects, people, happenings, ideas, etc.) at any time. Your awareness is of what "concerns you now" together with the sense of obligation or responsibility you experience at any given time as related to what concerns you at that time. You are by no means aware of all the determinants of your awareness—that is, all the aspects involved in a total transaction of living except for which you would not have the awareness you do.

You can become intellectually aware that your experience at any time is an almost infinitesimal drop in the bucket of what you might be potentially aware of and is even more limited with respect to all the happenings and stimulus-excitations going on within and around you—what Harry Stack Sullivan labeled "selective inattention." Through analysis you can see that what you are aware of at any given time, that your "selection" of possibilities for awarenesses is made on the basis of what is of importance, worth, or value to you relative to your immediate purposes whether these concern the retention of your psychological "form," structure or set or the effective participation in novel situations, or both. You can become intellectually aware that there is no *at*tention without *in*tention. As expressed by Horace Kallen, "Consciousness is attention between divergencies which decision temporarily relieves by bringing one to dominance." [11]

To state the matter somewhat differently, you can understand intellectually the difference between what you are "aware of" and what you are "taking into account" in any transaction of living. This was expressed by Mr. Justice Holmes as "an intuition of experience which outruns analyses and sums up many unnamed entangled impressions which may be beneath consciousness without losing their worth." [12] You can understand intellectually that you become aware of certain factors you are now taking into account, but had previously been unaware of when your behavior was incomplete because you had not experienced the consequences you expected from your behavior—i.e., as when a front tire on your car blows out and you suddenly swerve; when you go up in a fast elevator and become aware of your gravitational adjustment; when you underestimate the magnitude of some task you have set out to accomplish; when a trusted friend disappoints you; when some institution or ideology "fails" to give you expected satisfactions, etc. You can be intellectually aware of the legal concept that a person is guilty only if he had a certain "intent" in his awareness at the time the particular act was committed.

AT ANY ONE TIME, then, there is a multiplicity of happenings potentially available for awareness, together with a multiplicity of previous happenings available for recall and a multiplicity of possible future happenings available for expectancies. Of all the phenomenal aspects of any transaction of living which we are taking into account during that transaction of living, we are aware only of those aspects which we are in the process of giving meaning or significance to in order to experience the consequences of the purposeful behavior we are trying to participate in or trying to initiate. From the psychologist's point of view, then, "awareness" as a quality of any transaction of living is not merely an adornment of nature but itself plays a functional role.

From the point of view of our present discussion, this fact must be especially borne in mind since our behavior in everyday life seems to involve an implicit adherence to value and moral standards of some kind which basically pattern our behavior.

DIFFERENTIATION OF THE SIGNIFICANCES WE EXPERIENCE

IN order better to understand where valuings and moral ideas fit into the total orchestration of human experience, it may be helpful to differentiate between what we might term various "matrices" of experience. In making such differentiation, however, we must recall that each matrix is interdependent upon all other matrices and that no one would exist except for the others.

A. *Our perception of the world around us*

HERE we refer to our experience of objects and people as these seem to exist in a world outside of ourselves and seem to have attributes and characteristics of their own that can be placed in the space-time continuum. It can be demonstrated that the attributes which we assign to the "things" outside of ourselves—whether objects, people or societies—are significances which we build up in the course of our experience, are learned. Insofar as our subjective perceptual experience corresponds to what we encounter in the environmental situation, then our perceptions are judged by us as correct or accurate. From this point of view we may say that the world as we experience it is the creation of our perception and not the cause of it. "Naked sense impressions simply do not occur, and the traditional analysis of our conscious experience into naked sensations as building blocks is palpably bad description." [13] This does not imply, of course, any variety of solipsism since we would not have our normal perceptions except for impingements from the outside environment. It should be particularly stressed that from this point of view our perceptual awarenesses are only probabilities—guesses or hunches that we make, based on our previous experience, as to what the attributes of "things" are. This parallels Korzybski's conception that there is no such thing as a raw "reality" but only that which we evaluate in terms of our values-fears-past-history, etc. [14]

B. *Our awareness of sequential significances*

HERE we refer to our assumptions that a certain event will be followed by another event, that events take place in sequences. When we are able to predict with considerable reliability what the sequential order of events will be, we experience a sense of surety. On the other hand, we become apprehensive when we cannot predict consequences.

From the point of view of the relationship between the sciences and the humanities, it is important to stress that all of man's scientific inquiry and the ingenious applications man makes from this inquiry are concerned either with extending the range of man's perceptual and motor processes (radar, television, airplanes, etc.) or with improving the reliability with which he will be able to predict and manipulate sequential events. Man has already created a bewildering variety of artifacts which he seems to have designed for the purpose of insuring that certain sequential events will follow other events in a direction which he can reliably predict. The important point to bear in mind here and to be elaborated later is that scientific inquiry as such does *not* concern itself with the problem of rightness or wrongness, the goodness or badness, of these sequential events which the scientist tries to understand and to control.

We stated above that our perception is only a probability. It is a probability for *action* or some potential action which we might undertake. Perception, then, has reference to the future as well as to the past. We act in order to experience some consequence from our actions, in order to achieve what we call some "purpose." The purpose which we intend to achieve may be immediate or it may be a long-range goal.

The purpose which we set out to achieve, the consequence which we hope will result from our action, is obviously not a purpose that exists in a vacuum or that is determined entirely by whim or the circumstances of the moment. Purposive action seems to have as its ultimate goal the experience of *value satisfaction* which may take the form of the rudimentary attempts to preserve our physiological organism or, particularly characteristic of human beings, the more basic and ultimate satisfaction of experiencing some *emergence*, some novelty that we characterize as "richer," "higher," "better." As I have stated elsewhere, "the outstanding characteristic of man is his capacity to participate in the creation of emergent value attributes which enrich the quality of his experience." [15] It would appear that if we do not root our conceptual scheme in this value matrix characteristic of man, then all the other matrices tumble since their function appears to be to *serve* man in his ceaseless striving for value satisfactions.

SOME INFERENCES RELATED TO HUMANISTIC INQUIRY

I HAVE taken the liberty to outline the point of view expressed above in the hope that it will provide in bold relief a background against which to consider what seem to me important aspects involved in the development and func-

tion of moral ideas. The genetic development of moral ideas has been brilliantly traced by Jean Piaget, as well as by numerous psychologists and social scientists in the United States and England. From the data so far gathered by these investigators and from our own analysis of what seems to be an intrinsically reasonable account, I should like to call attention here to at least five aspects or characteristics of human experience that are related to the development and function of man's moral ideas: purposive behavior, hitches or obstructions, choice, inquiry, and the reality of faith.

1. *Purpose*

WHEN YOU DO SOMETHING, you nearly always do it because of some intent, aim, or purpose. You are generally only aware of a single intent, aim or purpose. And in doing this something—for example, reading this paper—you sense that "you" are involved in directing the doing because of "your" decision or intuition as to what will be the best thing to do under the particular circumstances, what will bring about a sense of worthwhileness and satisfaction, or, in other instances, what it is necessary to do in order to maintain life, to carry on, etc. The intent, aim, or purpose you have in mind when you do something is experienced with varying degrees of conflict or lack of conflict concerning its "goodness," "rightness," "efficacy," etc.

You can realize intellectually that while your naive, on-going, unanalyzed experience is of some single and particular purpose—that is, a desire for the coming-about in your awareness of some particular consequence—if this purpose is to be carried out, a number of intermediate purposes will also be involved. For example, while your purpose at the moment may be to read this, you are also involved in the intermediate purposes of maintaining your equilibrium in a chair, holding this paper, focusing your eyes, etc. Furthermore, you are not reading this simply for the purpose of reading it but because such reading is presumably related to other, "higher" valueful purposes having to do with your basic standards of what is worthwhile and what will bring about a sense of personal satisfaction, development, etc.

In any transaction of living there is a multiplicity of purposes involved. These require differentiation and a choice of the satisfactions to be derived from various possibilities of what behavior is *for* anyway, what the value standards for this behavior "should" be. An individual's "sensed values"—this is, his own feeling of what is "important," "worthwhile," or "satisfying" are ultimately the impelling aspects of living that lead to any behavior at all. In any transaction of living it appears that the purposeful aspect of the transaction can be further differentiated into three factors: the first involving and insuring the preservation of physiological and psychological processes, the second "directing" action and sensed as the "purposive" accent in experience, the third involving a sense of the consequences the action will have once it is initiated. Each of these

three factors has its own felt significance and no one of them would be experienced except for the felt importances of the other aspects. A "purpose" therefore becomes a weighted average of multiple purposes.

2. *Hitches or obstructions*

THE PROCESS of living involves participation in situations which you do not by any means sail through without experiencing some obstruction, some obstacle, or some problem. You experience some sense of frustration, which may be great or small, ephemeral or relatively enduring. This frustration may come about either from a difficulty in carrying out effective behavior that will lead to some pre-determined goal, or, it may result from your concern as to what goal is the proper one for you to pursue anyway. Your sense of frustration in these respects is characterized by what you call "worry," "inferiority," "guilt," "struggle," "indecision," "anxiety," etc., depending upon the circumstances of the particular occasion.

On analysis you can be aware of the fact that no matter how annoying or upsetting the hitches or problems you encounter may be, these are almost inevitable aspects of living in a cosmos where the future is undisclosed and where you, as a participant, must play a role in determining that future. Furthermore, you can become intellectually aware that it is only insofar as you encounter illusions, surprises, disappointments or other varieties of obstacles and problems that you yourself "learn" something, that you yourself have an opportunity to test out new choices, hunches, and formulations by experiencing the consequences they lead to in action. Problems of "how" to achieve a pre-determined end challenge and hold the possibility of clarifying and enlarging your value standards, that is, your own code of ethics, morality, or worthwhileness.

A transaction of living involves in more or less degree a set of conditions that present a problem for choice or action. The ability to meet the problem depends upon the adequacy and appropriateness of the pattern of assumptions we bring to bear on the occasion and only by "working through" the problems can we build up more inclusive and more appropriate assumptions for future occasions.

3. *Choice*

YOU SENSE, sometimes vaguely, sometimes intensely, that what you do involves the choice you make of alternatives and possibilities; the hunch you have that your intended actions will result in the intended consequences with their intended satisfactions. You have a sense of greater or less surety concerning the probable effectiveness of your choice; a sense of more or less conflict between alternatives involved in making your choice. And in the process of choosing and carrying out selected behavior resulting from choice, you have a sense of more or less personal responsibility.

You can be intellectually aware that you have no absolute control over future occurrences and that chance is likely to play a greater or less role in your behavior. You can become intellectually aware of many of the factors you are taking into account in the process of choosing. You can observe that many of your choices concerned with long-range goals involve the selection of alternatives and possibilities which you feel will lead to further alternatives and possibilities that will make future choices more effective.

Since what we call the "future" is made up of non-repeatable, undisclosed happenings, a transaction of living involves in some degree the aspect of choice with the corollary aspects of personal responsibility and anixety concerning the consequences of that choice. "Choosings are seen to be process of the normal consciousness, each a present passage to an anticipated future having no guarantees and contingent on 'faith' and 'fortune' as well as on the energies and intellect of the chooser." [16]

4. *Inquiry*

AS YOU PARTICIPATE in a transaction of living, you sense that you are more or less figuring out how to do what you want to do, or, that you are making some evaluation of what is most worthwhile doing, what you "should be" doing.

On analysis, we can become intellectually aware that insofar as our behavior is completely reliable, certain, and effective we will go on to further behavior which will lead us to further desired consequences, but that when we run up against some obstacle, some difficulty, some sense of inadequacy, we become aware of this and must undertake some inquiry. If the difficulty encountered is one of *how* to achieve a pre-determined goal, we make use of rational, logical inquiry involving conceptual abstractions which in its most highly developed form can be labeled "scientific inquiry." On the other hand, if a difficulty involves a choice of goals, a lack of surety with respect to *what* goals we "should" pursue, then we undertake a different kind of inquiry: instead of indulging in rational and intellectual processes alone, we undertake what we refer to as "mulling things over," "reflecting," "meditating," in which we try to weigh the reliability of different value standards. We can sense that associated with inquiry of the former type is the collection of facts, the accumulation of knowledge, the attainment of skills, the use and development of artifacts, the development of "know how," the proper use of scientific method, etc. Associated with the latter type of inquiry are the less tangible but equally "real" experiences concerned with the development of faith, the acceptance of things past, the cultivation of charity, the broadening of love, etc.

In any transaction of living there is a multiplicity of alternative possibilities with respect to what goals an individual may pursue and a multiplicity of alternative possibilities with respect to how he may best realize any intended goal.

It is with respect to the form of inquiry involved when we must decide *why* we should do one thing rather than another (or possibly why we should do anything at all) that the psychologist still has to create some method of investigation. And it is in this area especially where he can learn from the humanists, skilled in description or portrayal, how individuals have learned to sensitize themselves to value inquiry. For, as already stated, the process involved in such value inquiry is totally different from the processes involved in the inquiries necessary for solving procedural difficulties. We remember that Aristotle said in his *Ethics,* "The end cannot be a subject of deliberation." Value inquiry is intensely personal and unique. You always feel it as yours. It involves what is the "me" built up from the past facing the transition of the present into the future as "I."

The function of this "value inquiry" is to provide us with a value judgment that will serve as a compass, a directive for action. In "value inquiry" we are seeking standards of rightness, wrongness, more right than, goodness, badness, beauty, ugliness, etc., which will serve as signs or clues and which will indicate to us the nature of the probable consequences we will experience by following a particular course of action. The standards we use and question in "value inquiry" concern our duties, loyalties, and responsibilities. Hence the value judgments we reach through "value inquiry" involve "conscience," "charity," "humility," etc.

The role of "value inquiry" is symbolized by the Hindu custom of marking one's self between the brows with ashes each day in order to be reminded of the "inner vision" provided by a "third eye"; it is reflected in the hymn which says, "Lead, kindly light, amid the encircling gloom."

DESCRIPTIONS of value inquiry are almost necessarily best given us by poets. A revealing description by a modern poet is found in Christopher Fry's *The Lady's Not for Burning.* In the excerpts which follow, Jennet, who had been accused of being a witch and is to be burned the next day, is wondering whether or not to accede to the request of Humphreys that he enter her cell at night and sleep with her, in return for which favor Humphreys will have her sentence revoked because of his official position. Her decision not to accede to his request is a value judgment. Jennet soliloquizes:

> Don't speak, contemptible boy,
> I'll tell you: I am not. We have
> To look elsewhere—for instance, into my heart
> Where recently I heard begin
> A bell of longing which calls no one to church.
> But need that, ringing anyway in vain,
> Drown the milkmaid singing in my blood
> And freeze into the tolling of my knell?

That would be pretty, indeed, but unproductive.
No, it's not that . . .

I am interested
In my feelings. I seem to wish to have some importance
In the play of time. If not,
Then sad was my mother's pain, sad my breath,
Sad the articulation of my bones,
Sad, sad my alacritous web of nerves,
Woefully, woefully sad my wondering brain,
To be shaped and sharpened into such tendrils
Of anticipation, to feed the swamp of space.
What is deep, as love is deep, I'll have
Deeply. What is good, as love is good,
I'll have well. Then if time and space
Have any purpose, I shall belong to it.
If not, if all is pretty fiction
To distract the cherubim and seraphim
Who so continually do cry, the least
I can do is to fill the curled shell of the world
With human deep-sea sound, and hold it to
The ear of God, until he has appetite
To taste our salt sorrow on his lips.
And so you see it might be better to die.
Though, on the other hand, I admit it might
Be immensely foolish. [17]

CHRIST AND GANDHI may be taken as examples of individuals who were trying to create an environment in order to act on the "what for" value judgments emerging from their value inquiry. In order to indulge in the necessary value inquiry, Christ went to the top of the mountain and Gandhi had his day of silence.

Most of us, at times, have wanted to be alone so that we could "mull things over." We apparently need to insulate ourselves in this way from immediate here and now conditions as we weigh those standards that are not bounded by time and space considerations. Such insulation allows our conscious and subconscious processes of mentation and feeling the widest possible range.

And some such insulation also allows us to make a more accurate distinction between (a) those feelings and emotions related to our physiological bodily activity and the conditions at the moment of which we are a part and (b) those overtones of feeling which derive from the standards for value that have become a part of our assumptive world and that are not dependent on a specific set of conditions or actions in the here and now. It is these value standards that sustain us between one doing and the next. Insofar as we feel sure of these value standards, we can weather frustration and deprivations; if we have no such value standards, then we feel lost.

We use our value standards to give us the most reliable bets for obtaining

a repetition of some experience that has been satisfying. And it is especially characteristic of human beings also to use value standards as springboards for obtaining some new satisfactions they feel will emerge in the flow of the present from the past into the future.

The value standards each of us uses are the consequences of our action in the past that have been registered, and have become a part of our assumptive world insofar as they have proved to be good bets for further judgment and action. This registration is not of an intellectual nature. It is a change, a confirmation, or a denial of the weight to be given different assumptions concerning the "worthwhileness," the "goodness," the "rightness" of any action. Thus our complex of standards serves both as our criterion of satisfaction and as our best guide for effective action.

The process involved in "value inquiry" is one of trying to expand the range of the cues we can include. We attempt to increase our value specifications. These are bounded neither by the space-time considerations of any immediate situation nor by conceptual specifications. Hence, if a person accepts as absolute and inviolable any variety of ideology, the clues he uses in his value inquiry will be restricted, and the directive for action indicated by his inquiry will lack the reliability it might otherwise have. For the reliability of the directives reached through value inquiry is directly related to the adequacy of the cues taken into account. The point was made by Hayakawa: "People who are not accustomed to distinguishing between attitudes institutionally arrived at and those extensionally arrived at are capable of real self-deception. In a real sense, they don't know which of their opinions are simply a parrot-like repetition of institutional opinions, and which are the result of their own experience and their own thinking. Lacking that self-insight, they are unable to arrive at realistic self-concepts; they are unable to map accurately the territory of their own personalities." [18]

In cases where we have resolved a "what for" hitch and have arrived at a value judgment or decision, we may conceptualize this decision to ourselves or feel emotionally that it is good and proper. However, it is important to bear in mind that this conceptualization or feeling can be experienced only because of a large background of value standards which constitute an important aspect of each of our assumptive form worlds.

If this is not recognized, we are apt to make the mistake of believing that our purposive decision in and of itself is of a final or ultimate nature and justifies any action that may lead to its accomplishment. Furthermore, these value standards are largely on the silent, non-verbal level. By and large we are quite unaware of them and, except in rare cases, have never "thought them through" or systematized them. Yet they are the standards against which we measure our feelings of pleasure, happiness, our sense of well-being, our sense of self-esteem, our "ought I" judgments.

Thus it becomes "wrong" to act on the basis of the adage, "The end justifies

the means" insofar as the consequences of our actions will not ultimately lead to what we expected. The glib rationalizations and conceptualizations of a particular "end," together with the action we take to achieve it, may prevent the realization of those unconceptualized, unconscious value standards without which the specific end we have in mind would not exist. There is a marked contrast between the ease with which most of us can rationalize why we have set a particular goal and the tortuous, soul-searching type of rationalization in which Lincoln indulged.

RATIONAL inquiry, while not excluded in the resolution of difficulties on the *why* level, is only of secondary importance. In "what for" purposive inquiry, we keep expanding our reference base. This extension cannot go on freely, as indicated before, if an individual is disturbed by impingements from his senses. Apparently the function of our senses is to give us a standpoint in time and space so that we *can* act *after* we have decided *why* we should act.

Thus to return to Gandhi as an example, the function of prayer for him, and one of the functions of some of his fasts, was to sensitize himself to cues that could be taken into account in the process of value inquiry in order to achieve the most reliable and satisfying value judgment. He was trying to take into account a synthesized phenomenon which he could feel, rather than abstracted aspects of a phenomenon he could grasp intellectually. It was only *after* what Gandhi called his "instinct" had shown him a course of action was right that he tried to determine intellectually why it was right.

The resolution of a difficulty encountered on the *why* or *what for* level, and the consequences of action that follow, more likely than not involve some modification of our previous assumptions, some revision of our assumptive form world. Decisions involving purpose are peculiarly our own, since the value standards that compose so crucial a part of our assumptive form world constitute a complex of value assumptions unique to each of us. These decisions, therefore, involve both responsibility and opportunity. These interdependent responsibilities and opportunities are highly personal. They are products of our unique biological equipment participating in the culture unique to our own life history.

Judgments concerning *what for* and *why* are often disturbing or painful because the resolution of "what for" or "why" difficulties does involve a modification or revision of our assumptions. Hence, we may try to delay them or temporarily rationalize the dilemma away.

Practically all of us at times try to avoid—and usually unconsciously—many hitches on the purposive level of "what for." We do this by keeping ourselves busy, by pursuing only the means involved in earning a living, or by escape through over-indulgence in entertainment, by over-concern with what we eat or wear, by escape through drink, or by rationalization. In some such cases, we are making the false assumption that solving hitches in the means will bring

personal development. In other instances, we may be deliberately marking time in the hope that things will change and we can renew our pursuit of goals. Or in order to obtain some relief from the anguish of making such decisions, we may let other people make the decisions for us, possibly leaving the responsibility to God or to some charismatic leader. A prolonged inability of individuals to make these "what for" decisions themselves provides the psychiatrist with many of his patients and the political or religious leader with followers who are blindly devoted.

We get satisfaction in our experience only insofar as *we* are involved in *action* as well as in *judgment*. If there is no participation, no action on our part, there is no real satisfaction, no value attribute to our experience. It is our action only that can be registered in us and that can give some stability to or cause some revisions in our assumptive form world. And it is only through action that our value judgments have the possibility of being registered beyond ourselves, as was pointed out long ago in the parable of the Good Samaritan.

If our satisfaction is to be genuine, our action must be related to a "what for" reason. Otherwise, there is no assurance at all for the very existence of value standards. Real pioneers in any field seem to sense this. For example, Charles Edison reports, "After an invention became a commercial success, father simply lost interest in it."

All our means of "how-to-do's" are related to some purpose, some "what for's," even though in many cases we may be quite unconscious of the purposive assumptions involved. It would seem that insofar as a person can obtain insight into the purposes that lie behind the means, he can experience what we label personal development, a "richer" life, emergent values.

If value standards are continually disregarded, then the means may become goals in themselves with a consequent "lowering" in the satisfyingness of experience, a "lowering" for which the experiencing individual may not be able to account. We can see examples of this in those who fish to win a prize, those who earn more money than they need to satisfy their wants simply in order to become rich, those who try to get a college degree for the sake of a degree, those who strive to live on a reputation after achieving some position that has prestige in their particular social group.

There is a submergence of an individual's capacity to make value decisions involving purposes insofar as he is coerced to do anything, insofar as force is a factor he must heed. Compulsion restricts the free flow of value inquiry. This necessarily means that the quality of satisfaction obtained in living will be "lower." Under compulsion a person is forced to worry about means, about "how-to-do's" and his consideration of purposes becomes dulled or restricted by fear, insecurity, intimidation, or the uncertainty that comes from being unable to test his own decisions in action.

As we have already said, value judgments are intensely personal and unique. Hence, freedom exists only insofar as an individual makes decisions on his own responsibility. This is an inalienable right, rooted in the very biological organization that characterizes human beings. If the possibility to make one's own choice does not exist, there is not true liberty but, rather, some degree of enslavement.

Also, insofar as an individual is freed from frustrations, for example by being protected by parents and others from encountering difficulties, he will be unable to experience personal growth in the sense of progressing from one value judgment to another value judgment that is more satisfying because it is more inclusive and provides a better bet for effective action in new situations.

A problem for every individual, or for every group or society or ideology, therefore, appears to be the problem of clarifying purposes and simplifying means. Clarification of purposes in terms of creating value standards that serve as effective and satisfying guides for action can be a never-ending process. And it is such for individuals who themselves surmount the continuing hitches or frustrations brought about by changing conditions. The process of value inquiry they engage in and test by action gives them increasingly adequate value judgments. Insofar as an individual becomes complacent and static in his own value judgments, then living becomes repetitious, loses its zest, and changing conditions bring increasing puzzlement or new searches for escape.

And it appears that only insofar as an individual "raises" the level of his purposes can he minimize the annoyances of life. Only then can discrimination be improved and means become simplified by being judged in terms of more inclusive purposes. In the *Bhagavad-Gita* there is a verse: "The wise should perform tasks without attachment, yet with as much ardor as the foolish, who are bound up in the results of their deeds—thus to the world shall they set an example."

5. *The reality of faith*

WHILE IT MAY be easy enough for us to realize intellectually that all of our own perceptions of objects and people, our prehension of the sequences which events may take, our purposes and our values are only probabilities, in everyday life we cannot possibly act only on the basis of what might "probably" happen. We must, as Vaihinger noted, act *als ob*. We must make fixed assumptions, have certainties and beliefs. For example, as we carry on the process of living we have to assume that the chair which we are about to sit in *is* a chair; we have to assume that certain people *are* trustworthy; we have to assume that certain actions *are* the right actions to take. Throughout the whole process of living, then, we are continually engaged in the business of making certainties out of probabilities in order that we can act effectively to attain some value satisfactions. Thus objects and people become realities for us. Causal effects become realities for us. Purposive behavior becomes a reality for us. Our values and

moral codes become realities for us. All of these become realities in concrete situations and must become such if we are to act at all. While our action in such concrete situations takes place in a milieu bounded by time and space, the values which carry us through this action transcend time and space. Yet they become real in our experience only insofar as we transact—as unique and responsible individuals endowed with the capacity to choose—within the environment around us.

In the same way, the symbols man has created to conceptualize his awarenesses and the behavioral patterns, such as rituals and ceremonies that he sustains in order to "feel" value relationships, are realities from the point of view of the individual acting in his unique behavioral situation. Apart from the behaving individual acting in a concrete situation, these realities would not exist as such. But to deny them from the point of view of the experiencing person can lead only to chaos and ineffectual action. The individual, then, becomes the focus of reality. And in creating our patterns of value and our moral codes, we seem constantly to be attempting to integrate more and more specific purposes which are themselves unconceptualized and undetermined.

REFERENCES

1. P. W. Bridgman, "The Task Before Us," *Proceedings of the American Academy of Arts and Sciences*, LXXXIII (1954), p. 98.
2. L. Price, *Dialogues of Alfred North Whitehead*. (Boston: Little, Brown, 1954), pp. 127f.
3. John Dewey and Arthur F. Bentley, *Knowing and the Known* (Boston: Beacon Press, 1949).
4. Alfred Korzybski, *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics* (Third edition, Lakeville, Conn.: Institute of General Semantics, 1948), p. 93.
5. *Ibid.*, pp. 107f, 189, 192, 243, 265, *et passim*.
6. *Ibid.*, p. 35.
7. *Ibid.*, p. 359.
8. H. A. Murray, *Explorations in Personality* (New York: Oxford, 1939), pp. 608f.
9. Korzybski, *op. cit.*, Chapters 24-26.
10. A. N. Whitehead, *Modes of Thought* (New York: Macmillan, 1938), p. 4.
11. H. M. Kallen, "Freedom, Anxiety, and Social Process," in *Educational Freedom in an Age of Anxiety*, ed. H. G. Hullfish (New York: Harper, 1953), p. 32.
12. Jerome Frank, "Some Tame Reflections on Some Wild Facts," in *Vision and Action*, ed. S. Ratner (New Brunswick: Rutgers University Press, 1953), p. 77.
13. Bridgman, *op. cit.*, p. 194.
14. Korzybski, *op. cit.*, Chapter 2.
15. Hadley Cantril, *The "Why" of Man's Experience* (New York: Macmillan, 1950), p. 159.
16. Kallen, *op. cit.*, p. 33.
17. Christopher Fry, *The Lady's Not For Burning* (New York: Oxford Press, 1950), pp. 82f. (Quoted with permission of the publishers.)
18. S. I. Hayakawa, *Language in Thought and Action* (New York: Harcourt, Brace, 1949), p. 304.

THE IMPORT OF THE WORD "TRANSACTION" IN DEWEY'S PHILOSOPHY

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JOHN DEWEY'S philosophy should be of special interest to students of general semantics because Dewey construed the problems of philosophy as the problems of men and because he saw also, as the major block to the solution of these problems, vicious language-habits. If one tries to correct the bad words of philosophers—or of people in general—one must almost always use these words in the effort. Great luck is required for one not to get fouled up by the old meanings of these words or by the guilt by association which the proposed new words tend to take on.

To pinpoint the major difficulty that Dewey found in the philosophical and in the human enterprise, I will say that he looked upon all of our key-words as locking the doors to free inquiry and successful communication. These words, for the most part, are elementalistic words such as "subject," "object," "element," "entity," "mind," "soul," "self," "consciousness," and "matter." Dewey appreciated the practical man's complaint that philosophy is just words, words like those just mentioned being the chief offenders in that they are not informative of the *connections* among things through which alone the words that name these things can perform a useful service. So Dewey's philosophy replaces these old encapsulating words—those which dissociate person from person, persons from the world, a person even from himself, appearance from reality—with new words that have some life to them. These new words are notably "transaction" and "situation" and "context" and "event"—words that serve rather than master us and that promote rather than block inquiry. These new words are behavioral in the sense that they point to what is named, point also to the agency doing the naming whenever anything is named, and point above all to the behavioral situation within which the naming-named makes sense. Transactionalism replaces idle words with dynamic namings conjoined with events named.

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Let us consider now quite ordinary instances of what Dewey had in mind by the name "transaction," and we can then see more easily why he thought this fruitful for the transactions of philosophers, scientists, and indeed all those who intend to be intelligent.

CONCRETE CASES of transactions are borrowing-lending, buying-selling, writing-reading, parent-child, and husband-wife. The paired names evidently go together and are thus correlative. There can be no borrowing without lending, no buying without selling, no problem in any of these cases of how we can get the paired terms together. A man may have quite a problem in getting a wife—and *vice versa.* But, once he has a wife, he is a husband and can have no problem of getting a wife, unless it is a new one. He makes a costly mistake if he regards himself as a distinct element or entity and his wife as another such, each independent of the other. Stated generally, the point here is that it is a serious misuse of words to use the word "element" where the word "aspect" is called for, or to use a word as though it named an element where the only thing to be named is an aspect. A husband and wife are aspects of a situation or transaction. Before they became husband and wife they were separate individuals in a sense in which now they are not, and it would make sense to speak of them as then an aggregate of two elements in the relation of *inter-action.* But just as we should not speak of elements when we observe aspects or phases, so we should not speak of inter-actions when we observe transactions.

WE MAY now consider some of the important ways in which Dewey's philosophy is transactional and thereby of special interest to psychologists, physicists, scientists in general, as well as to philosophers and to students of general semantics. Dewey's thesis, in its broadest terms, was that traditional philosophy has been of little help in solving the problems of men because these problems in fact arise within a single world of experience whereas the problems with which most philosophers have concerned themselves have been those of reconciling irreconcilable worlds of thought, chiefly the mental world with the physical world.

Minds, for example, were supposed to come equipped with self-starters. That is, they were supposed to be actors in the sense of self-acting "substances" or "creators" or "causes." What was transactional was mistaken for self-action. When we look back over the history of psychology, it seems comical that a science of the "mind" could appear more scientific than the science of the "soul" which it replaced, for the mind was a scarcely less pretty and respectable theological and metaphysical entity than the soul. But to get on, when physicists undressed nature and laid its physical "substance" or "reality" bare, the philosophers became hard pressed to explain the inter-action between "mind" and "matter." Ever since, the central "problem" in theory of knowledge

has been this puzzle of how such diametrical opposites can interact, how an elemental, encapsuled mind can even know that a material world exists.

For the physicist, at least so long as he stuck to his professional role, these difficulties could be breezed over, "matter" (or matter-energy) being what matters (for observation and measurement). For the psychologist likewise, until of late, "minds" were all he had in mind.

Dewey argued that these difficulties and a host of others stemming from them would quickly disappear and make way for genuine, negotiable problems if science and philosophy adopted a straightforward empirical approach. Dewey hoped—but was perhaps overoptimistic in believing—that empiricism would quickly show up the mind-actor as of the Hollywood variety, and the mind-matter dichotomy as equally fictitious. Let us forget, at least provisionally, Dewey proposed, the elusive inner "mind" and all its aliases—"consciousness," "soul," "self," "brain," "organism," or whatever is supposed to be a self-acting "subject" or "substance." Let us forget, too, the strange world "out there beyond" our "consciousness"—whether it be called "Reality" or "God" or "essence" or "matter" or anything else alleged to be independent of our states of "consciousness." Let us, instead, get back of our theories to our actual practice, to our experience and conduct, as human beings working in psychology, physics, and philosophy. Let's be good reporters for a change, noting carefully just what we observe and all that we observe, free from dictation by past theory as to what we are supposed to observe. What do we find? And where in our findings does it become either necessary or useful to bring back these entities which we have provisionally thrown out? We will bring them back, if at all, only observationally and behaviorally.

DEWEY entertained, and later in collaboration with Arthur F. Bentley, proposed for behavioral research a number of interesting postulations.[1] Looking to our experience and behavior, we find, first of all, the act of *experiencing*, and we never find in this act an experiencing cut off from an event experienced. We find this act, in other words, to be a transaction, a behavioral transaction of organism-environment within which the organism and the environment are indissoluble phases or aspects, not separate elements, of the transactional event. We find ourselves (organisms) breathing, but together with air being breathed, breathing being an operation just as much of the environment as of the organism. We find ourselves loving persons loved, resenting persons resented, suffering something suffered.

[1] "Postulations" these are termed in order to avoid possible confusion with the alternative word "postulates." The latter has the dictionary meanings either of what is "taken for granted as the true basis for reasoning or belief" or what is proposed, as by Dewey and Bentley, simply as "a condition required for further operations." See their *Knowing and the Known* (Boston: Beacon Press, 1949).

On higher levels of our experience, we find ourselves naming events named, and we find in this language-behavior a very special organism-environment transaction, one that distinguishes human beings from other organisms without yet imputing a discontinuity between them.

Note, in none of these findings has there been any necessity for invoking a "mind" or any of its myriad aliases. There is nothing subjective about these experiences, for the experienced environment is always there to keep us company. And this amounts to saying that we experience nature. It is only by means of double-talk and self-deception that we ever come to refer to nature as enjoying an objectivity in the sense of being independent of experience. To those of us who are not possessed by "minds" as people were formerly possessed by "devils," nature comes naturally. Experience can make healthy sense of the saying that *we have minds:* in the sense, for example, that our naming of named natural events is a *minded* kind of experience (transaction). But we are in immediate and dire trouble when we get to jabbering about *minds having us!* In being the father of modern philosophy (nothing has ever been said about the mother, this presumably being another case of self-action or creation), Descartes fathered upon us his "I think, therefore I am," showing how his mind possessed him. It would surely be saner to say: "I am, therefore I think."

THE SO-CALLED psychological view of experience (nature) which has been presumptive from Descartes's time to our own can be contrasted with the transactional conception in a way to make the latter clearer. Take my experience of a beautiful sunset. On the psychological view, the following, or something very like it, is said to have "really" happened:

> I (my mind) had a perception, a visual one, consisting of a perceiving and a percept. The perceiving is complex, composed of visual-sensing plus memory-imaging plus interpreting based on past experience. The percept, likewise, is complex, composed of discrete sensations—sense-data. But finally, as a part, somehow, of the perceiving, there is a judging (or, likely as not, misjudging) that the sensations, the sense-data, though altogether in mind, are nonetheless qualitatively like and perhaps identical with the actual physical qualities of the independent sunset. As for the beauty of the sunset? Well, this most certainly does not belong to the sunset but, instead, to a feeling in my mind.

And, interestingly enough, the more this psychological view of experience is pressed to its logical conclusion the more of the sunset becomes an apparition, some "feeling" in my mind. Ultimately, all my experience (including you) becomes my dream.

Dewey would have none of this nonsensical distortion of experience, and how philosophers could hold this view in the name of empiricism he found the most amazing thing of all. This post-mortem dissection of experience into

disconnected fragments, all cut off from what we commonly call the world—which if reached at all is reached by prayer or faith—is patently *not* a *report* of experience. This dissection, this analysis, is the product of thought, and though this thought is grantedly itself a kind of experience it is radically different from the experience (transaction) it claims to be explaining. It commits what Dewey calls "*the* philosophic fallacy," the fallacy of "conversion of eventual functions into antecedent existence." [2] Let us see what he means by this.

The actual existence, the fact, the event, was the experienced beautiful sunset, incorporating without any bifurcation the organism and the environment together. To say that the beautiful sunset was in my experience is to say, semantically and factually, precisely the same thing as to say that it was an event in nature. What Dewey calls "the eventual function" is this event's eventuating in a later event, where the proper function of the latter is to *explain* but not *explain away* the earlier event. The fallacy arises in the substitution of conceptualized dual entities, psychological and physical, for the original unfractured experience. And the fallacy is scandalous when committed by philosophers or scientists who pride themselves on being empirical and scientific in the very act in which they are being rampantly rationalistic metaphysicians and verbal magicians.

WE HAVE now to explain in what way experience can *properly* be regarded as a psychological affair. Though experience is always transactional, it is frequently troubled, precarious, indeterminate, unsatisfactory. Life is not all a beautiful sunset or a bed of roses. Much of the time we are lost in a smog, and we wonder whether the trouble is of an inner or outer sort, whether the trouble is to be located on the side of the experiencing organism or on the side of the experienced environment. When we observe the experiencing aspect of the transaction in our attempt to ascertain whether the trouble lies there, we are in the proper domain of psychology.

Psychology analyzes the various ways or acts of experiencing such as perceiving, remembering, feeling, thinking, desiring, etc., and, in addition, the various mechanisms underlying and connecting these *acts*. Transactional psychologists are now emphasizing, in vehement agreement with Dewey, that experiencings are not passive reception of information from a ready-made environment but are, rather, dynamic ways of structuring, re-structuring, and thus utilizing the environment—all in the interest of satisfying the needs of the organism. Dewey has been corroborated in his recognition that all our experiencings, or almost all of them, are better understood as continuous phases of *conduct*. In place of the older psychology of mind we are getting now a psychology of personality and of human motivation. Perceiving, feeling, remem-

[2] *Experience and Nature* (Chicago and London, 1925) p. 35.

bering, and all the other acts of experiencing can no longer be analyzed separately; they have to be viewed serially and in context as a conducting of impulses or motives of which the agent is often unaware. We do not understand a man's perceiving, for example, if we do not understand what he is looking for, and that, whatever this specifically may be in the individual case—and however much in the dark the individual himself may be as to the target of his search—it is something that he hopes will sustain or build him up.

When the causal mechanisms which are required for experiencing are mistaken for qualities of what is experienced, psychology oversteps its boundaries. The mistake lies in confusing an effect with a cause (or partial cause in the sense of a necessary condition). Thus, to return to the sunset, though sense organs are a necessary cause of the experiencing, the qualities of the sunset have nothing in them to entitle us to call them "sensory" with the imputation of their being subjective or mental. The innocent layman does not like to be and he ought not to be talked out of his belief that the qualities of the sunset—including its beauty—belong to the sunset; a sunset, transactionally specified, is not so deprived. Theories of knowledge, drawing heavily upon the psychology of perception, have too frequently jumped from the psychological fact that, say, visual sense organs are necessary mechanisms for seeing to the unwarranted conclusion that what we see is sensory. The qualities of the sunset as we observe them don't announce or introduce themselves as sensory, and when, therefore, we confuse a psychological cause of our perceiving with the natural qualities of that which we perceive we are deserting observing (and reporting). It takes carpenters to build a house, but we do not say, therefore, that in perceiving a house we perceive carpenters or that our perceptions are of a carpenterish kind.

Too, it seems utterly arbitrary to name the qualities of the sunset after a "psychological" rather than after a "physical" cause—since both kinds are involved. The mistake in speaking of sensory qualities or sensations or sense-data is repeated when we speak of a memory-image as the datum of memory. We remember past events as directly as we perceive present events. And while, doubtless, we have bad memories as we also have unreliable perceptions, this is no proof at all that in each case we apprehend immediately only a mental datum and must then infer the existence of an independent object.

WHAT ABOUT the place of physics relative to experience and conduct? The purpose of sticking strictly and consistently to transactional inquiry, in this instance, is to prevent physics from reducing nature (and thus, possibly, degrading it) to whatever elements are reached through physical analysis. If we watch what physicists do—in place of lending gullible ear to what they may *say* they do—we find they always leave natural events intact, with all their qualities and all their aroma, tone, and flavor, just as *we* experience them. The abstractions that the physicist often finds it expedient to make do not do a job

similar to that of the surgeon's knife. Nor do we find reason at all for construing the so-called primary properties (like number, shape, extension, etc.) as somehow intrinsic to "real" physical matter or energy as distinguished from and contrasted to the so-called secondary properties (color, texture, taste, smell, etc.) and tertiary qualities (beautiful, ugly, horrible, sublime, etc.) traditionally aimed at the psychologist's IN basket. No, we find the physicist just as we found the psychologist, inquiring into the causal mechanisms of experience.

With this difference. It is the experienced rather than the experiencing which gets the physicist's attention. Because of the precarious character of much of human experience, because of our need to make experience more satisfactory, more dependable, more valuable, we have to understand the physical as well as the psychological mechanisms underlying experience. Because of the deductive power of mathematics in prediction, explanation, and control with respect to those elements to which it can be applied, such elements have been accorded the honorific label, "primary." But while the "primary" or mathematical properties of observed events are a lead to the physicist (and often to other scientists) in inter-actional inquiry which carry us from observed events in nature to unobserved events in nature, they take us neither "beyond" experience nor into a more "real" experience. The mathematical physicist (or mathematical biologist, sociologist, etc.) is simply having a *different* experience, one characterized by his own habits of abstracting, one which notably yields physical controls in our dealings with natural events on the level of transactional experience. And on this level, where our valuings may comprise much more than prediction, explanation, and control, the "primary" qualities of nature are no more primary, no more to be accorded a favored significance, than the "secondary" or the "tertiary."

DEWEY'S pragmatic transactionalism gives perspective to the havoc which psychological theories and physical theories have played in philosophy. When we think of Dewey we immediately think—or should think—of *doing*. His pragmatism is a philosophy of action, a philosophy that is practical in its insistence that theory should serve (guide, clarify, emancipate, expand, improve) rather than frustrate the purposes of men. When we look at psychologists and physicists and other scientists in action, see them as human beings working in laboratories, performing experiments, writing on blackboards or on paper, then we plainly also see that all cases of self-action and of inter-action become intelligible only within that kind of action that is transaction. Then we see, too, that the disparate worlds and disparate entities—that have multiplied like rabbits—have been conjured up by bad thinking and bad language.

So revolutionary is Dewey's thinking, so recalcitrant our language, that I feel I need first to live with people, share their living experience, before I can explain his ideas to them. I am reminded of one of my experiences years ago.

On vacation in Yellowstone National Park, I was feeling really much closer to nature than a few weeks earlier—after just completing a doctoral thesis titled "Mind and Nature." A group of wealthy businessmen asked me what I had been doing. When I explained that I had been teaching philosophy and completing my thesis, they said, in all seriousness, "That is very interesting. And *now* what do you intend to do?" When I replied that I intended to go on teaching they found it difficult to believe me and remarked that I seemed much too active and promising a person for that! They pictured *the* philosopher—as, alas, we have all been taught to picture him—as the thinker, something like Rodin's sculpture of that name, in an ideal pose of immobility deemed essential to that superior kind of thinking that rises above "mere thinking" to a direct contemplation of Reality. Only, like Dewey, the businessmen couldn't buy this picture. They preferred a transaction to a trance.

SO WE ARE back to the problems of men. Bertrand Russell, classifying human problems as conflicts of (1) man with nature, (2) man with man, and (3) man with himself, points out that it is these last-mentioned inner conflicts which are now most pressing and most depressing. It is these, after all, which greatly exacerbate the conflicts of man with man. It is anaesthetizing to be reminded of the cynicism, the sense of futility, the gripping feeling of an unfixed fear, the neurotic personality of our time, the failure of theory and of education and of philosophy, the pathetic and anxiety-ridden movement back to God, which reflects man's loss of confidence in himself. The biggest problem confronting men today is the utter indeterminateness of their situation, the fact that they are so burdened, so fed up with futile thinking, that they are no longer able even to locate or define their problems. Pushed around like "things," they react like "things." Exploited, they exploit. And, taught that philosophy is no longer regarded by professional philosophers as in any way a way of life but rather as a way of thought, a respectable way of retiring from life and putting inhibitions to prestigeful purpose, increasingly technical, increasingly abstract, increasingly couched in an esoteric language that manages to escape confusion—if at all—only by losing its audience along the way, men feel that life has become too damned complicated and incomprehensible.

Men want to understand and want to be understood. But, in place of understanding—along all those dimensions that the word used to suggest—they are offered only analysis, they are picked into pieces. Science, they are told, is analysis. Philosophy is analysis. And then there is the escape into what has to be called psychoanalysis. The wholeness and integrity of self get lost. What is left are broken fragments in a void.

Men want to communicate because only in communication with other selves can they be, or rather become, themselves. But such communication is transactional, involving *af*fective and only thereby *ef*fective identification of self

with self—something quite different from inter-actional communication of mind with mind.

DEWEY proposes that we view the human situation transactionally. This means, negatively, that we are not greatly helped by the common admonition to replace bad thinking with good thinking, or even bad language with good language. What is indeterminate or unsettled is not just our thinking or our language but the full transactional situation of which our thinking and language are but phases. If thinking is not to be circular and impotent, subjective in the sense of subjection, private in the sense of privation, then we must first get back of thinking to live observation of unthought and unverbalized events observed in nature. If thinking is not to be just thinking, language not just a verbal massage, we must learn to view and to employ thinking (and what often passes for knowing), as well as the symbols which can either paralyze or spur it on, as intermediate and instrumental within *inquiry*. Put positively, there are no rigid rules of thought. Rules of thought are instruments constructed within and by inquiry, always subject to revision and improvement—since it is the business of these tools to emancipate rather than to imprison inquiry.

The import of transactionalism, in the stress just placed on observation unwaffled by an incipient metaphysics in our prior ways of thinking and talking, lies in the overlapping and complementarity of nature, art, history, and science.

When a scientist tells us to be scientific if we mean to be at all intelligent, we are apt to get the impression that he takes a dim view of nature as experienced, of art, and of history. Transactionalism exposes as bad fiction the notion that these different words stand for separate worlds. Of course, we can speak of observation as "cold perception." Some observations are indeed chilly. But many are quite properly called "appreciations," and they glow with that same warmth and intimacy of the beautiful sunset.

And our personal histories, the scientist's, I am sure, as much as those of the rest of us, have a lot to do with what we appreciate and find valuable and hence actively observe. If a scientist were put on the spot and asked to tell us frankly why he makes certain observations rather than others, his answer, if it could be elicited, might prove very illuminating and show how very human he really is.

Science would be better and more honest science if it were taken for the art it is and if the sentiment of the scientist, like that of the rest of us, did not have to be repressed as sentimentality. What awful Puritans we have permitted ourselves to be! When the *exact* language of science is paraded before us as a paradigm, we should retort that much of it is a parody—it conceals as much as it reveals. Poetry and metaphor can be more faithful to living observation and to full transactional inquiry than precise prose, though the latter plays a necessary role within inquiry.

WE ARE familiar with Wendell Johnson's IFD formula as applied by general semanticists to our indeterminate situation. Indeed, we have lately gone from idealization to frustration to demoralization. Pragmatic transactionalism is intended to serve our ideals by making the latter workable, practical, and realistic.

Now the way to save ideals is to be concrete. To be concrete is to recognize, for one thing, that we live only in the activity of the present, not in the past as an earlier present, and not in the future as a present that has not yet come to be. When we take our present activity for what it is, for what we can plainly *observe* it to be, once our transactional point of view has exorcised the ghosts of past and future (as just defined), then we see and feel that we already are a free and creative activity though not as free and creative as we want and need to be. Taking ourselves in the present where we are, not where we aren't, we abandon a morbid subjectivity. We discover that we are not walled off and shut in from nature and our fellow human beings in nature. We find in our direct observation of nature what Heisenberg has helped to emphasize in terms of physics: observing nature is a dynamic and creative business of altering nature. Our world is what we make it, as we are also what it makes us.

So the nub of Dewey's transactionalism, or at least what I take to be its center of impact, is that we really want to *live*, that thinking is for the sake of richer and more meaningful living, that living is not for the sake of endless and dead-end thinking, and that if ever we are to live we must begin to live *now*. What prevents this from being nearly platitudinous is the revealing reorientation it supplies for the meaning of "past" and "future." The behavioral meaning of "the future" lies in present anticipatory ideas and ideals. Likewise, the behavioral meaning of "the past" lies in a formulation of present problems in terms of an historical frame of reference—the historical facts, thus laid out, and classified as psychological, biological, physical, chemical, or whatnot, are then treated as conditions of which we must take account in deciding how to act right now.

We are not creatures but creators of history. History is creative intelligence at work. We have minds. We are dupes when we think of minds or history or a mechanical universe having us. Mechanism, of whatever sort, is as much a function of the present as of any previous present or succession of presents and is thereby a part of the meaning of "freedom."

We have every reason to believe that some later changes in the world will be deadly different from what they otherwise will be if we are wise now in our choice of ideas and ideals as plans of present and future action. Our later present may not be a Christmas present, but it is much more likely to be what we ask of it if we make the right decision about our future, as a transactional aspect of the now.

HOW ARE DATA INTERPRETED? A TRANSACTIONAL VIEW

HANS H. TOCH *

A STORY is told by Otto Klineberg about a patient who was convinced that he was dead. Neither entreaties nor reasoning could sway the self-styled corpse from this conclusion. As a last resort, it occurred to one of the doctors to ask whether dead men bleed. "Why no," the patient replied, "as a matter of fact, we don't." A jab with a scalpel brought a flow of blood. "By golly," howled the patient, "dead men *do* bleed!"

Science rests on interpretation. The scientist provides categories for the integrated consideration of his research results.[1] It is even hoped that the synthesis of such constructs might lead to schemes whereby each fragment will somehow fall into place, and interpretation become a matter of derivation or deduction.

In other words, the empirical scientist assigns meanings to data, thereafter manipulating these meanings as if they constituted shorthand for the data, expecting to arrive at more inclusive summaries corresponding to more data. Since such correspondence would in each case be contingent on the validity of preceding steps, the psychological determinants which enter into the assignment of meaning, and their effect on the potential validity of such meanings, are an important factor to consider in gauging the success of the general enterprise.

It is here that the personal equation enters, since objects do not have inherent meanings which are simply passively registered by us. "Telling the meaning of" something is always a joint product of the "something" and the person doing the "telling." This kind of product has become known as a "transaction," after Dewey and Bentley. [2] Even perception, the means whereby data are arrived at, is a joint product of what is perceived and of the purposes and past experiences of the perceiver.[3] As Hadley Cantril has put it, "the meaning we relate to any sense impression is derived only *through* our past experiences as we have tried to carry out our purposes." [4]

It has been shown by means of a simple demonstration that the image

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thrown on the retina by a chair may be the same as that projected by a variety of arrangements which look most unlike chairs if inspected from any other angle; yet, one unfailingly sees a chair.[5] Why a chair? Because the retinal image involved has always in the past belonged to something "sittable on," four-legged and rectangular. When one approached the object and sat down, one never landed on the floor. Past experience *tells us* we are dealing with a chair, even when we are not, as in the demonstration.

If interpretations are shaped by interpreters, objectivity, in the sense of *accepted* meanings or interpretations, can thus only refer back to a communality of experiences and purposes on which the meanings are based. Everybody sees chairs in the demonstration referred to, given the common benefit of many years of successful chair-sitting.

SUCH CONSENSUS is a poor criterion of validation. For one, it carries the unfortunate implication that it is desirable to share other people's purposes and past experiences. Moreover, what is unorthodox at one time often becomes orthodox at another, so that, in endorsing a contemporary "fact" we may reject a future one. Further, continuous agreement tends to preclude progress, since it prevents the emergence of anything new. The scientist, therefore, cannot rely on consensus alone to validate his interpretations.

Neither can he check his interpretations directly, since what is experienced is never available other than in experience: the reliability of an interpretation (in experience) is the only possible test of its validity. However—and this is perhaps the point—the same type of psychological factors which may make the original interpretation invalid may operate with regard to the interpretations against which it is compared, as in Klineberg's story.

Psychological factors impairing validity have frequently been discussed under the heading of "bias," defined as "the way in which opinion and prejudice and egoism intrude upon and influence scientific belief." [6] The premise is that "opinion," "prejudice," "egoism," or what have you are extraneous and alien to the process of "believing," and that they operate by "influencing" its somehow pre-determined course.

However, if one refrains from visualizing man as a passive recipient of ready-made meanings, one cannot speak of qualitatively different categories "biased" and "unbiased." There are merely beliefs in the formation of which certain psychological determinants are given more weight than they are with others. The extent of their influence, of course, ultimately affects the chances that what is believed comes close—as close as human limitations will permit—to the object of belief.

It will be the contention of the following that the stronger the motives underlying an interpretation are, and the more systematic and structured the interpreter's psychological world is, the greater are the chances that his interpre-

tation will not be reliable, and that he will tend never to discover this fact himself.

Purpose and Potential Validity

IF ONE could speak of an overall psychological function of interpretations, it would fall under some heading such as "need for the categorical." Meanings, after all, provide bases for action by structuring and stabilizing what is intrinsically unstructured and indeterminate. Without stability and reliability in percepts, beliefs or scientific postulates, purposive living would be impossible. In this sense, every meaning denotes an act of faith. It takes place in the face of the potential confusion in which it has its roots. It is this point, I think, which Horace Kallen makes when he writes that "cravings for safety and certainty appear to be sustained by the indeterminateness pervading the most singular human situation. . . Determining the indeterminate alleviates the cravings; and since this is a passage from what is, to what is not yet and need not be, it is an act of faith with its intrinsic risks." [7]

"Intrinsic risks" probably refers to the point of diminishing returns implied in the process. If no intellectual discomfort is tolerated, what has been a protective screen becomes the foundation for a prison. An excess of faith leads to precipitous betting on unsafe odds.

This caution may be extended to purposes underlying specific meanings. William James has written that "as a rule we disbelieve all facts and theories for which we have no use." [8] What probably comes closer to the truth is that, other things being equal, the less use we have for something the greater will be the tendency not to accept it, and vice versa.

A number of experiments by psychologists may be summoned in support of such a statement. One finding of this kind is that words of special interest to a person will tend to be recognized much faster than others which are not. Similarly, distasteful or threatening words need to be exposed for long periods in order to be "legible." It has also been found that convincing a person under hypnosis that he is "poor" will make him over-estimate the size of coins, whereas the *same* person will tend to underestimate the *same* coins if he has been persuaded that he is "rich." Disks with emotionally laden symbols (such as dollar signs or swastikas) are seen as larger than disks containing drawings which represent something neither liked nor disliked.[9] Studies of election appeals have shown that arguments with which the prospective voter agrees are noted and remembered at the expense of those with which he disagrees. Similarly, when prohibition was an issue, advocates of one or the other side regarded their respective views reinforced by the same set of printed statements. Pro- or anti- Russian "rumors" were found to be "accepted" in line with previous attitudes about Russia.[10]

If an interpretation may be thought of as a categorical statement covering

certain data, the amount of such data required for a given interpretation, that is, the evidence necessary and adequate for a bet to be placed, can be regarded as decreasing as motivation increases. Interpretations which satisfy the person's requirements extremely well would need a minimum of experiental verification, an extreme instance being the *credo quia absurdum* of the devout. By the same token, interpretations running counter to purposes would tend to have higher empirical requirements.

RICHARD RUDNER, in a recent paper on value judgments in scientific validation, has indicated that in validation "the scientist must make the decision that the evidence is *sufficiently* strong or that the probability is sufficiently high to warrant the acceptance of the hypothesis." [11] What is true of interpretation thus becomes equally true of validation.

"Objective" failure or success need not necessarily be experienced as failure or success. Moreover, if and when it is, the validating act can be dissociated from its premises or otherwise have its significance changed to deprive it of its relevance to the validity of these premises. By this means, something a hypothetical outside observer would regard as invalidating can even be reinforcing to an interpretation. A sufficiently highly motivated interpretation may tend to be self-validating, and therefore self-perpetuating.

One such self-validating mechanism is illustrated in the story of the patient who thought that he was dead, and wanted to sustain this belief. The means the patient chose to accomplish this end was to retract the proposition "blood, therefore not dead" (implicit in the admission that dead men do not bleed) at the sight of blood. As an alternative, he could have indulged in invalid reasoning like "dead men don't bleed; I bleed, but I am *so* dead." He might also have blinded himself to the blood, or maintained that it was ink. Still simpler would have been a retroactive qualification, such as "*some* dead men may not bleed, but . . . ."

A more down-to-earth illustration is provided in a recent article in the New York Herald-Tribune (March 8, 1954) about the Nazi concentration camp in Dachau, now a memorial to atrocity victims. A part of this memorial had to be closed because German authorities found it "offensive to good taste." "Relatively few Germans," the article reads in part, "are among the steady flow of visitors to the Memorial. One of the caretakers said some of the guests had said the larger of the crematories was built by the Americans after the war for propaganda purposes. Other informants in Munich said this view is still fairly widely held in Bavaria."

The observation of crematoria is thus made compatible with the motivated premise "people didn't really suffer at German hands," by interpreting the data on the basis of another premise, the belief that Americans conspire to discredit Germany. The latter probably satisfies the same ethnocentric motives.

The process of validation is not automatic, but may be channeled by the validator in a multiplicity of ways. The more incentive to devious courses is provided by purpose, the more suspect is the validation, as well as the interpretation being validated.

The Closed System

As a rule highly systematic, logically consistent interpretations also provide strong means for selectively processing data. Koestler lists, as one of the characteristics of a closed system, that it "refuses to be modified by newly observed facts but has sufficiently elastic defenses to neutralize their impact—that is, to make them fit the required pattern by a highly developed technique of casuistry." [12] Another former communist declares, with regard to the influence of this system on his interpretations, that "developments which seemed detrimental to Russia were regarded as ephemeral, dishonestly interpreted, or canceled out by more significant countervailing developments." [13]

The closed system thus operates to prejudge data, by providing "correct" interpretations for them, which do not threaten its premises. In its "essential features," as William James has noted, the closed system is therefore "irreversible." [14] The believer is confined to move *within* the system, unless and until he abandons it.

The prime function of the systematic aspect of any system is probably simplification and unification. Carried to an extreme, these functions may be satisfied at the expense of validity. Criteria of validation may become exclusively formal ("does it fit?") and no further checks may be demanded. A closed system is an economical one. Like a bird's cage, it limits the world, but provides for maximum security and a minimum expenditure of energy.

Psychotic delusional systems yield many illustrations of predetermined interpretation of data, in line with key interpretations (such as "I am being persecuted by individuals in high places who are communists," or "I am a reincarnation of Vishnu").

Such extreme examples are not qualitatively different from more ordinary versions of interpretations of particular events. Any systematization carries with it the predefinition (within limited degrees of freedom) of a universe of potential data, which are categorized, evaluated, and structured in terms already provided for. As in the immortal trial scene in *Alice in Wonderland*, the defendant may be condemned and ordered to be executed before testimony has ever been considered.

Validity vs. Security

It is necessary not only to distinguish between subjective validating criteria and hypothetical criteria of actual validity, but even more essential to recognize the relationship between the two, as implicit in the above.

What we have argued is that the more the personal validating criteria tend toward satisfaction and feelings of security, the further would the hypothetical "objective" criteria depart from those the interpreter uses. Further, the more functional an interpretation is to the interpreter (either as satisfying a set of purposes or as fitting into some predetermined scheme), the more functional —and therefore the less reliable—would be the validating criteria.

It boils down to an opposition of potential validity to security, of objectivity to vested interest. In order to maximize potential validity, it is necessary for the interpreter to derive his satisfactions from his *dealings with* the data and theory, not from the interpretations themselves. A scientist must gain his security through the scientific process, never through the product.

In short, to the extent to which ideas become causes, they diminish, for psychological reasons, in the faithfulness with which they mirror the happenings to which they refer. Since science aspires to maximum potential validity, the scientist must be content with minimum satisfaction from the substance of his interpretations. He must, like the saint, stand steadfastly on guard against the ever-present manifold of temptations from within.

REFERENCES

1. M. Planck, *The Philosophy of Physics* (New York: Norton, 1936), pp. 121-122.
2. J. Dewey and A. F. Bentley, *Knowing and the Known* (Boston: Beacon Press, 1949).
3. W. H. Ittelson and H. Cantril, *Perception: A Transactional Approach*, Doubleday Papers in Psychology (No. 7) (New York: Doubleday, 1954).
4. H. Cantril, *The "Why" of Man's Experience* (New York: MacMillan, 1950), pp. 65-66.
5. W. H. Ittelson, *The Ames Demonstrations in Perception* (Princeton: Princeton University Press, 1952).
6. E. G. Boring, "The Validation of Scientific Belief," *Proceedings of the American Philosophical Society*, 96 (1952), p. 535.
7. H. Kallen, *Human Beings and Psychological Systems* (Princeton: Psychological Research Center, 1954), p. 15. See also Planck, *op. cit.*, pp. 119 ff.
8. W. James, "The Will to Believe" in *The Will to Believe and Other Essays in Popular Philosophy* (New York: Longmans Green, 1902). p. 10.
9. F. H. Allport, *Theories of Perception and the Concept of Structure* (New York: Wiley, 1955), pp. 309-319.
10. D. Krech and R. S. Crutchfield, *Theory and Problems of Social Psychology* (New York: McGraw Hill, 1948), pp. 347-349.
11. R. Rudner, "Remarks on Value Judgment in Scientific Validation," *Scientific Monthly*, 79 (1954), p. 152.
12. A. Koestler, *Arrow in the Blue: An Autobiography* (London: Collins, 1952), p. 231.
13. L. Fischer and R. Crossman (ed.), *The God that Failed* (New York: Bantam Books, 1952), p. 205.
14. James, *op. cit.*, pp. 12-13.

✡ BOOK REVIEWS ✡

Perplexing Perceptions and Passive Personalities

PERSONALITY THROUGH PERCEPTION, by H. A. Witkin, H. B. Lewis, M. Hertzman, K. Machover, P. B. Meissner, and S. Wapner. New York: Harper and Brothers, 1954. 571 pp. $7.50.

WITKIN and his associates put people in situations calculated to disturb their perceptions of which way is up—straight up—and measure how far from the vertical their best guesses are. The tilting-room-tilting-chair test utilizes a very cleverly designed apparatus consisting of a small room which can be tilted from side to side. Just inside the one open wall of the room and facing its interior is a chair which also can be tilted from side to side. Thus, a person seated in the chair can be tilted in varying amounts to his right side or his left side, and the room which he views from the inside can also be tilted right or left. Controls allow the subject to adjust the tilt of the room, or chair, or both. Both the task of adjusting the room to the upright while the body is tilted, or that of adjusting the body (chair) to the upright while the room is tilted require a complex integration of visual and bodily cues. The type of error made reveals how much the person relies on the visual field or on his bodily sensations. For example, if, in adjusting his body, he calls himself vertical when actually tilted the same way as the room, the visual field is dominating; if he adjusts himself close to true vertical, he is resisting the visual field and relying on bodily sensations.

The rotating room is similar to the above apparatus in that both room and chair can be tilted, but the whole thing, including the seated subject, can be rotated smoothly and quite swiftly about a circular track. Both room and subject are upright at the beginning of a trial, but the vector of the force the subject feels on his body is the result of gravity and centrifugal force 90° in opposition. The angle of force varies with speed of rotation. Here again, adjusting body or room to the perceived upright can be visual-field dominated or bodily-sensation dominated.

In the rod-and-frame test the person is seated in a dark room facing a tilted luminous square in which there is a tilted, moveable luminous rod. Success in adjusting the rod to the objective upright requires something more

than the other two tests. The subject must not only utilize bodily position but "must *extract* the rod from the tilted frame with reference to bodily position" (p. 25).

Tests such as these reveal large and consistent individual differences not only in success of performance but in *manner* of performance. Witkin first detected these differences during World War II. Instead of concentrating solely on the physiological and perceptual factors involved, he and his associates began to think of the problem in terms of the whole person—more specifically, in terms of possible relationships between manner of performance and personality characteristics. Anticipation of such relationships was based on reasoning that "adequate orientation toward the upright is of great and continuous importance to a person," that "the body is directly employed in orientation, and the body bears a close relation to the self," and that in detection of the upright:

> [T]he subject may make his determinations mainly with reference to the outer field, or mainly with reference to sensations within his body. He is thus confronted with essentially the same type of situation that people frequently encounter in everyday life, where it is necessary to choose between standards based on one's own impulses and feelings and standards derived from environmental pressure. (p. 14)

During the ensuing ten years, the problem was studied in quantitative, correlational fashion, calling upon unusually diverse resources of personnel, methodology, and equipment. Specialists in experimental psychology, clinical psychology, personality theory, projective testing, and perceptual research all lent their talents to the work. For personality assessment they utilized paper and pencil tests, projective tests such as the Rorschach and Thematic Apperception Test, questionnaires, clinical interviews, and case histories; and—no small achievement in itself—they devised ways of turning the results of almost all of these into the form of reliable numerical scores or indices. They studied a variety of populations, including young, normal adults, children, and hospitalized psychiatric patients.

THE RESULTS, it seems to me, are a lesson in what can be accomplished by a concentrated attack on a limited hypothesis, and they constitute an important break-through in the personality-perception area. In summary, these researchers found that:

1. "[F]ield dependent persons tend to be characterized by passivity in dealing with the environment; by unfamiliarity with and fear of their own impulses, together with poor control over them; by lack of self-esteem; and by the possession of a relatively primitive, undifferentiated body image" (p. 469).

2. Persons who make better use of their bodily sensations and succeed in "abstracting" from the field (as in the rod-and-frame test) tend to show the opposite personality characteristics. "Independent or analytical perceptual per-

formers . . . tend to be characterized by activity and independence in relation to the environment; by closer communication with, and better control of, their own impulses; and by relatively high self-esteem and a more differentiated, mature body image" (p. 469).

3. The study of children coupled with the other results gives the impression that inability to "abstract" from the field is associated with relative immaturity.

4. Women tend to be more field-dependent than men, but when the situation makes it easy or important to do so, they utilize sensations of bodily position in a manner very similar to men.

This summary does not, of course, do justice to the wealth of suggestive generalizations and factual and methodological detail to be found in the book. One suggestion made by the authors I shall include because it is a good example and should be a particular interest to students of general semantics.

> It is likely . . . that if a person has this basic ability to "break up" a configuration it will be manifested not only in straightforward perceptual situations, but in problem-solving situations as well. In brief, it is suggested that the capacity for active, analytical dealing with the field, first manifested in the separation of self from environment, is carried over to perceptual activity in general, and may be expressed in intellectual functioning as well. (pp. 477-8)

Should this be true, and it seems likely that it is, it would seem to have important implications for relationships between personality characteristics and ways of dealing with language.

BEFORE concluding, a couple of negative comments are in order. It is difficult to understand why some measures of intelligence were not included in the study, especially in view of the fact that available experimental evidence would suggest a correlation between intelligence and performance on some of the perceptual tasks.[1] An even more serious criticism, it seems to me, is the authors' failure to take adequate account of experimentally demonstrated relationships between stress and perceptual performance. In general, such studies show that the more stress an individual feels, the more he tends to isolate himself from the "field." Are there stress-arousing elements in being tilted, rotated, placed in the dark, tested? I cannot escape the gnawing suspicion that this factor may have played some role in the experiments of Witkin, *et al*.

Because of the generally favorable tone of this review, I should caution the reader about a few matters. It should be remembered that the theory developed in this book is somewhat narrow and not well related by the authors to other important perceptual theories dealing with problems of perception and personality. Consequently, the implications of the findings as presented are frequently unclear, and sometimes confusing. Also, the writing, though admirably

[1] I am indebted to Professor Silvan Tomkins for suggesting this point.

precise, is discouragingly dull and repetitious. Reading this book is like reading twenty-five well-documented experimental reports selected from *The Journal of Experimental Psychology*, all the articles dealing with an aspect of the same problem. The experience is rewarding, but very fatiguing.

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Experience as Transaction

KNOWING AND THE KNOWN, by John Dewey and Arthur F. Bentley. Boston: The Beacon Press, 1949. 334 pp. $4.

NATURE AND HUMAN NATURE: MAN'S NEW IMAGE OF HIMSELF, by Lawrence K. Frank. New Brunswick, New Jersey: Rutgers University Press, 1951. 175 pp. $3.

IT SEEMS appropriate that these two books should be reviewed together. *Knowing and the Known* deals with that vexing, perennial question, how do we know what we know? *Nature and Human Nature,* in the surprisingly limited space of 175 pages, attempts to answer the much vaster and yet simpler question, "What *do* we know, anyway?" Both books exhibit much the same sort of attitude. The three authors strive with a kind of hopeful desperation to abandon the "normal" human universe of events half-perceived and three-quarters misunderstood, of old wives' tales, of myths and fictions and second-hand opinions garbled with experience, of the word-made truth. The result is that as one reads these books, the "normal" universe shrinks, evaporates, shifts its forms, becomes at once simpler, more complex, and less familiar. The change is painful, and will hardly become immediately popular: it looks pretty lonely out there.

Knowing and the Known was, I believe, John Dewey's last major publication. It appeared when Dewey was ninety years old, and when his collaborator, Arthur Bentley, was seventy-nine. The book itself, as the authors remark, is a record of a four-year inquiry into the theory of knowledge. Apparently all the chapters had been previously published in philosophical journals and had been altered only slightly before their appearance in book form. It thus seems fair to take *Knowing and the Known* as a sort of measure of Dewey's career,[1] and of his status as a philosopher, shortly before the time of his death.

Considered thus, the work has an obvious importance. But if it had been published by anyone else, or if it had appeared anonymously, *Knowing and the Known* would still appear as a work of vast consequence, almost certainly destined to have a wide and useful influence.

It seems to me neither appropriate nor very practical to try to summarize the content of these papers. I should, however, like to point out that the assump-

tions basic to the work, together with nearly all of the specific observations made by the authors, will prove thoroughly acceptable and most useful to general semanticists, and, indeed, have already been absorbed into the thought of some who write for *ETC.* For example:

> As philosophers, our disagreements with one another as to conclusions are trivial in comparison with our disagreements as to problems; to see the problem another sees, in the same perspective and at the same angle—that amounts to something. Agreement as to conclusions is in comparison perfunctory.

Thus the attempt to develop a theory of knowledge begins with a search for "firm names" with which to describe the phenomena at hand. Dewey and Bentley, however, modify this purpose by adopting the concept of language as a form of behavior.

> In seeking firm names, we do not assume that any name may be wholly right, nor any wholly wrong. We introduce into language no melodrama of villains all black, nor of heroes all white. We take names always as namings: as living behaviors in an evolving world of men and things. Thus taken, the poorest and feeblest name has its place in living and its work to do, whether we can today trace backward or forecast ahead its capabilities; and the best and strongest name gains nowhere over us complete dominance.

THE KEY term developed in *Knowing and the Known* is *transaction.* If I have understood the authors correctly, the term *transaction* insists on seeing events in the context of complex circular processes, rather than in limited, linear systems (an interactional point of view) or in isolation (self action). In an interactional system, knowers, knowing, and the known would be separate entities related to each other in rather simple, cause-and-effect style. This sort of statement permits the development of such terms as ideas, propositions, knowledge as separate entities, and even facilitates the notions of mind (as a repository of knowledge), intellect, and so on. The transactional view of Dewey and Bentley is at once simpler and more complicated; the knower is seen "as a phase of cosmic process with all of his activities including his knowings and even his inquiries into his knowings as themselves knowns. The knowings are examined within the ranges of the known, and the knowns within the ranges of the knowing."

This theory of knowledge, well understood and widely accepted, will have a revolutionary impact on the sciences of human behavior—and all the more so if its attitudes and techniques are generalized and applied to subject-matters beyond the scope of these papers. It is clear that the authors intend this profound effect, for their work is closely and directly modeled upon the remarkable intellectual inventions, from those of Maxwell to those of Einstein, which have produced modern physics. In short, the linguistic revisions which Dewey and Bentley

have produced in a crucial area are precisely the sort of thing that general semanticists have been talking about in a programmatic way for twenty years.

LAWRENCE K. FRANK, in his *Nature and Human Nature,* has undertaken, in a modest and unpretentious way, a task of a magnitude sufficient to paralyze almost anybody since the late Viscount St. Albans caught his death of cold. He has almost chosen for his subject that old chestnut among philosophical titles, "On the Nature of the World—and Man." In *Nature and Human Nature* the focus is on man's relation to the universe; Frank discusses, in turn, the geographical, internal, cultural and social environments, then attempts to set forth what is known about "our private worlds."

The author's purpose is simple but, as far as I know, unique. He is well aware that our increasing knowledge of the universe is more than a simple accumulation of facts; much of it has involved such profound alterations in "language and thought" as we have just seen exemplified in the Dewey-Bentley study. Moreover, our new knowledge, if we take it seriously, if we generalize its implications, must suggest new ways of behaving, of getting on in the world. Frank's book, then, rests on three assumptions: (1) that adequate, accurate summaries of current scientific knowledge of the world and man, written in non-technical terms, are not generally available; (2) that, given such summaries as a guide to behavior, people will think and act differently; (3) that their altered behavior will be a considerable improvement over the present variety.

Frank's achievement, in the difficult task he has set himself, is impressive. His erudition is enormous, and he is surely one of the few social scientists now extant to write with the unpretentious ease and the respect for language of a good essayist. I suppose it might be possible to take issue with Frank on some of his interpretations of research data and scientific theory; it seems inevitable that anyone's interpretations of so vast a body of material should be open to question. In any case, the philosopher of science soon leaves science (that is, the limited, special statements made in the laboratory) for the much less exact business of criticism. It strikes me, for example, that Frank encounters a problem of some importance when he tries to bring together his "biological" man and his "social" man. His concept of the ideal society is a "free" one which relies on discussion, persuasion, free choice and education as the means of social change. The concept of the "free" society, as Frank advances it, requires such terms as "the dignity of man" and "belief in the value of human personality" to implement it. In terms of the Dewey-Bentley studies, I should say that this is an interactional statement.

His view of human biology and ecology, on the other hand, is a purely transactional one (he refers on several occasions to *Knowing and the Known*) which treats man to what Kenneth Burke calls a reduction in scope; from lord of the universe he becomes simply a strand in the web of nature:

> We exist in the geographical environment, moving about in space-time, as we carry on our continual intercourse with nature, through breathing, drinking, eating, absorbing light, heat and other forms of radiant energy, eliminating through breathing, urination and defecation, through the skin and by radiation of heat, as the geographical environment flows in and out of us, as it does in all other organisms.

This concept of man in the universe is stated in its extreme form somewhat later, in a discussion of the internal environment:

> To understand man we must therefore recognize clearly how he exists as a process of continuous and fluctuating interchange between the geographical and internal environment. . . . The early beginning of a stomach and intestines was a tube that began by a folding of the organism around a hollow space into which water carrying food particles flowed, as we still can see in many simple sea organisms such as the sponge, and also in embryological development where the process of evolution reappears to a large extent. Apparently, the blood began as a fluid, like early sea water, which was enclosed in this envelope and began to circulate around inside, where it still has the same balance of salts as the early seas.

Although Frank argues several times that man loses nothing and gains much in dignity and individual worth by this metaphorical reduction to a skin tube floating in primeval seas, he is not, to me at least, very convincing. My own estimate of his problem is this: It is comparatively easy for a sophisticated and informed person to discuss man-as-individual these days. The intellectual taboos which we have so assiduously discarded in the last sixty-odd years have nearly all dealt with individual behavior and motives. But for every such taboo which we have lost, we have developed two new ones which deal with man-in-society. Thus it has become possible to discuss satyriasis, say, as an illness akin to the common cold, or indeed in any terms we choose. At the same time, we have, year by year, restricted the number and kind of statements which may be properly uttered about totalitarianism, democracy, treason, loyalty, anti-Semitism, and so on. So Frank, in presenting his "biological" man, is free enough to talk in transactional terms; but when he discusses the social environment, he is forced to take an interactional point of view.

THIS problem—if I am even remotely correct in my analysis—illustrates the great difficulty which attends all such revolutions or projected revolutions in thought. It suggests why it is comparatively easy for the physicist, dealing with his professional concerns, to develop and use new languages with enormous success—and then to abandon them once he has closed the laboratory door behind him. It suggests why the philosopher can abstract the useful features of the physicist's language and apply them, at an incredibly lofty level of abstraction, to a theory of inquiry without encountering too many difficulties. The trouble comes when we begin to revise, at a much lower level of abstraction, our perceptions of "everyday reality" and our attitudes to it. At this stage we

almost inevitably run counter to yet another environment, which I may refer to as "the environment of history."

If I were to suggest an addition to *Nature and Human Nature,* it would be a discussion of this "environment of history" as a special phase of the cultural environment. I speak of "history" with a purpose, for it seems to me that the anthropologist's concept of culture, on which Frank relies, does not usually take adequate account of historical factors. An environmentalist usually assumes, in these days, that we cannot escape our biology, our culture, our geography; yet he is not nearly so much impressed with the fact that we are all, to a great extent, products of an environment of intellectual history, which provides us with our tag phrases of value, our notions of ethics, our tacit assumptions regarding the way the world works. We can escape this environment only with great difficulty, by creating a limited, artificial one for special purposes, just as we can escape the environment of geography and climate by creating houses and fluorescent lighting and deep-freezes. But these artificial environments, whether of the physics laboratory or the deep freeze, are always limited and good for special purposes only. The environments which we inherit, of which we are always a part, can be modified only, and that only over a long period of time, and at great pains.

All of this brings me to one last point. All three of our authors—Dewey, Bentley, Frank—tend quite naturally to ally themselves with science and scientists, and even to assume that what they have done is somehow "scientific." This sort of assumption is not only natural; it has obviously proved to be valuable in producing two books of great worth. Nevertheless, the assumption troubles me, in a way. I think that a useful distinction might be made between scientific research, which I conceive to involve the systematic investigation and the testing of hypotheses under controlled conditions, and the sort of creative endeavor which is displayed in these books, which entails the making of new semantic environments to be tried on for size, so to speak. To think of this sort of work as "scientific" is to endow it with a sort of authoritative status which perhaps it should not possess, and which the authors of these two books sometimes find it necesary to disclaim. "These [statements] are not The Truth or final judgments," Frank writes. But would the disclaimer be necessary if the distinction between critical invention and research had been assumed throughout the book?

Perhaps this notion is simply a bias of my own; nevertheless, what I find most fascinating and most worthwhile in these books is not an accumulation of factual data, nor the exposition of a set of verified hypotheses, but rather the opportunity "to see the problem another sees, in the same perspective and at the same angle." That indeed amounts to something.

MARTIN MALONEY

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Hucksters at Home

THE EXURBANITES, by A. C. Spectorsky, with drawings by Robert Osborn. Philadelphia: J. B. Lippincott, 1955. $3.95.

MANY of the successful New Yorkers who are engaged in the mass communication industries live outside the city, beyond the suburbs, in areas which A. C. Spectorsky calls the "exurbs." In Fairfield, Rockland, Westchester, and Bucks counties, and on the North Shore of Long Island, these "short-haul expatriates" have created a culture of their own—a way of life which the author describes in amazingly close detail: their commuting, their love lives, their parties, their drinking, their relations with children, their money problems, and their secret dreams.

The "exurbanite" whom Mr. Spectorsky describes is "a symbol manipulator. That is, he writes, edits, publishes books, magazines, or newspapers; writes, directs, designs, costumes, or appears in radio, television, motion picture, or Broadway entertainments; or he is an artist, illustrator, photographer; or he composes popular songs, or commercial jingles; or he conceives, writes, lays out, or otherwise perpetuates the advertising programs which in turn support the magazines, newspapers, radio and television media; or he sells the time or space for such advertising. He is, then, a singularly commercial merchant of dreams for the rest of the nation."

And why should the exurbanites be scrutinized with such care and attention as the author has lavished upon them? Because, he says, "These people, God save us all, set the styles, mold the fashions, and populate the dreams of the rest of the country. . . . What they tell us to buy, by God, we buy. How they tell us to act . . . is a blueprint for our behavior. . . . They are our nation's movers and shakers for ideas and opinions, for what is fashionable and what is fun."

The question arises whether generalizations can be made about exurbanites in the mass communication industry that do not apply equally well to other people of like economic status in the same communities or to other people in the industry. Spectorsky is aware of the problems of overlap involved, and he is at pains to state what he regards as unique to exurbanites and what they have in common with other groups. Being unacquainted with the communities he writes about, I can only record a slight uneasiness about his generalizations and leave to others the question of their justice. But typical or not, the people whom the author describes are unquestionably an important segment of the communication industry. Whatever our public opinions or private fantasies or our wants as consumers, it is probable that exurbanites had a hand in stimulating or creating them.

The lives and dreams of those who mold other people's lives and dreams

are therefore more than a matter of idle curiosity. Korzybski wrote that, since human beings are a symbolic class of life, those who govern our symbols govern us. Spectorsky's work, then, is a study of our unacknowledged rulers, who largely do not suspect that they are rulers. What are they like?

THE "exurbanites" from whom Spectorsky draws his conclusions are, he says, much better educated than the average of the population. They make more money than the average. They are witty and talented and sophisticated beyond the average. But he also asserts that they are more insecure, more profoundly anxiety-ridden, than the average. He accounts for this anxiety with story after story illustrating the problems and tensions of writers and artists and advertising executives (he has an excellent ear for the language of Madison Avenue)—their surface affability that conceals a ruthless competition for place, their skill in throat-cutting by nuance, their perennial habit of living beyond their means.

Spectorsky believes that there are certain anxieties suffered by people in the symbol-manipulating industries that are "special and unique; they are self-contrived; they exist over and above the endemic malaises of the era; and, by their nature, they can never be resolved." One of these is self-doubt. Symbol-manipulators produce nothing but symbols—not lasting symbols like those of the poet or painter, but singularly ephemeral ones, for, in all but exceptional cases, last week's television show, like last year's ad campaign, is vanished forever. There is generally, the author says, "total cynicism about everyone's work but one's own. For one's own work there is an overt attitude of cynicism and a covert real regard, which can only be admitted to a degree to colleagues and not at all to strangers. While the work is being done one can be completely wrapped up in it, working hard and enjoying the techniques of the profession and the exercise of skills and talents. . . . It is only when the assignment is over and there is a hiatus before the next job's taken on, that perspective returns and a man can ask himself whether it's ultimately desirable for a mature and gifted individual to spend his energies on selling the crackle in a cereal or the suds of a soap."

The "exurbs," then, with their real trees and shores and hills, their gardens and house-repairing chores (providing endless opportunities for do-it-yourself gadgets), are an escape *to* reality. Some succeed in escaping, and return to the city strengthened and refreshed. But for most exurbanites the author has observed, there seems to be no escape. Fleeing the city, they take their fiction-laden patterns of evaluation with them, so that the war (which is within themselves as well as with others) is simply moved to a new battleground. As proof of this, Spectorsky says that most exurbanites, when they share confidences, begin to tell you their secret dreams, which invariably involve getting even farther away from New York City.

The motif that emerges with increasing clarity as the book proceeds is irony,

THE INDEX

TO THIS VOLUME HAS BEEN REMOVED FROM THIS POSITION AND PLACED AT THE BEGINNING OF THE FILM FOR THE CONVENIENCE OF READERS.

B J P S

The British Journal for the Philosophy of Science

CONTENTS FOR AUGUST 1955

ARTICLES

Logical Analysis of Gestalt Concepts — PAUL OPPENHEIM
One-Way Processes in Physics and Biophysics — L. L. WHYTE
Some Comments on Statements and Methods in Parapsychology and other Sciences — G. D. WASSERMANN
Strife about Complementarity (II) — MARIO BUNGE

NOTES AND COMMENTS

Comments on 'Degree of Confirmation' by Professor K. R. Popper — Y. BAR-HILLEL
Content and Degree of Confirmation: A Reply to Dr. Y. Bar-Hillel — K. R. POPPER

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